

Trucks & 4Runners

CONVERSION GUIDE

V6 & V8 engine swaps

- ⚙ Motor Mounts & Oil Pans
- ⚙ Cooling & Exhaust Components
- ⚙ Bellhousing & T/C Adapters
- ⚙ Crawling Systems



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This *Sixteenth* edition of the Advance Adapters Toyota Truck Conversion Manual is an accumulation of our experiences and knowledge in performing various types of conversions. The information and photos are directly related to the products offered by our company. We have put this manual together for your reference in either performing the actual conversion or trying to establish an estimate on tools & time required for your specific type of conversion. There are several reprint articles that have been supplied to us through the courtesy of various magazines. The information in this guide is constantly being updated and we ask that you verify any information that may be critical to your application. We recommend that you purchase the individual shop manuals for your particular vehicle. The information in these shop manuals will be more specific for torque specifications, gasketing, wiring, and assembly requirements.

SPECIAL NOTE: Catalog Contents

This manual has been put together with the best possible information available to us. Advance Adapters cannot accept the responsibility for vehicles and applications that are not standard. The contents of this brochure have been proofread before printing to minimize errors. We cannot be held responsible for errors overlooked. Please feel free to contact us with any suggestions or comments you may have regarding any portion of this manual. The information that you provide us could be useful in assisting other customers.



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Featured vehicle on front cover courtesy of Pepe Palomo.

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 Closed Saturday & Sunday

INTRODUCTION

This manual deals exclusively with Toyota 4WD trucks. Toyota 4WD trucks have been one of the more popular vehicles for the past several years. This is due in part to their performance, reliability, and excellent engineering.

Back in 1981, we first introduced a kit to install a Buick V6 with a TH350 transmission into these vehicles thus enhancing performance. Over the years, we have consistently updated and created new kits to meet the needs of the Toyota owner. We feel that these kits, when installed properly, will provide you with the same reliability and service that your stock vehicle once had.

There have been several variations of the Toyota pickup over the years. Different transmissions, transfer cases, and different body styles have been used. These changes created a variety of different adapters necessary when converting these vehicles. As you read through this manual, it is important that you look over the pages that pertain to your vehicle specifications. Proper identification of your stock drivetrain components is required. The use of this manual will aid in the stock drivetrain identification.

TOOLS REQUIRED:

Toyota pickups are put together with all metric fasteners. If you do not have a good selection of metric and standard wrenches, then we would suggest that you purchase the appropriate wrenches *before* you start your conversion. Along with these tools, it is advised that you have an engine hoist and a torque wrench to complete the conversion properly. Some conversions do require some welding or cutting for mounting of the engine. Please refer to your specific vehicle application listed in this manual for further information concerning modifications. For electrical wiring diagrams and Toyota torque specifications, you will need a Toyota 4WD service manual.

ENGINE SELECTION:

The first step is to define the use of the vehicle and then select a motor which best fits those needs. We manufacture motor mounts, headers, and adapters for most Chevy V6 and V8 engines, along with the Buick V6 & Ford V8 engines. Within this range of motors every practical need can be met. The engine size can create clearance problems in regard to the radiator, suspension, and firewall. These are an important factors when determining which engine to use.

SMALL BLOCK CHEVY V8:

There are many different Chevy small blocks. The 283, 305, 350, 383, T.B.I., T.P.I., LT1, LT4, LS1, and the Vortec V8 are all examples. When it comes to the usage of these engines *most* of them can be treated the same. The bellhousing bolt patterns on these block are all identical. (This is known as the 90 degree bolt pattern). These engines use a dowel pin alignment. The stock starter bolts to the bottom of the block except on some early blocks like the 265. (*Note: These early blocks, in which the starter bolts to the bellhousing, should not be used for conversions*). The flywheel can either be 153 tooth measuring 12-3/4" in diameter or 168 tooth measuring 14" in diameter. The 1985 & earlier flywheels are not interchangeable with the 1986 & later flywheels due to a change on the flywheel crank bolt pattern and balancing.

The Chevy starters have two different bolt patterns on the bottom of the block. The straight bolt pattern is normally used with the 153T flywheel, and the offset or staggered starter bolt pattern is normally used with the 168T flywheel. Many Chevy blocks today offer both starter bolt patterns on the block. Some of our conversion bellhousings require a special GM starter nose cone. If your stock starter is interfering with our bellhousing, you may need to grind on the bellhousing a bit or purchase a hi-torque starter which does not have a nose cone, **AA P/N 22-0003**. **WARNING: Do not use one our bellhousings with a diesel engine. The starter will not fit the bellhousing pocket on our bellhousing.**

The oil pans on Chevy blocks have gone through a few changes. Blocks 1985 & earlier are all the same, except the dipstick access is either on the driver's side or passenger side. In 1986, GM changed their gasket design to a one piece rear main seal. The earlier style oil pans will not fit the newer blocks. The computer controlled blocks in the '90s had oil level sensors added. The oil pans we manufacture do not have provisions for this sensor. **Caution should be used if you plan on using a newer Chevy V8 or 4.3 V6**. We have seen aluminum oil pans on most 1997 & later model blocks. This could cause problems with some of our bellhousing conversions since these oil pans also provided mounting holes for the stock bellhousing and because our conversion bellhousings do not offer these mounting options. Vehicles using these new blocks should consider retaining the stock transmission that was originally coupled to this engine. We offer a full line of transfer case adapters to couple these newer transmissions to your transfer case. This aluminum pan could also cause problems on vehicles 1986 & up without a suspension lift.

Most of the Chevy blocks used a triangular motor mount bolt pattern. Our conversion mounts all utilize this most common mounting configuration. In the late '90s, and with the introduction of the LS1 blocks, we've seen a variation from this bolt pattern. If you plan on using a LS1 block, we offer an engine mounting system for your application. GM also changed the crank flange stickout location on the LS1 block. This crank is recessed .400" closer to the back of the block than any other stock Chevy block. When this block is used in a conversion, the torque converter



or clutch components will need to be adjusted.

NOTE: LT1, LT4, ZZ4, and LS1 blocks all use angle port heads which is not compatible with our headers. These blocks also require a steam release port on the radiator. The radiators we offer do not have the steam release provision.

We do not recommend the installation of Generation III Vortec engines for Toyota Trucks. The narrowest exhaust we could find is 25", and the Toyota frame rail is 23". The height and width of this engine is too large for a good, clean fit.

CHEVY V6 BLOCKS:

This block can either be the 3.8 (229) or 4.3 V6. These engines are identical to the Chevy V8 application with reference to the bellhousing, starter, and flywheel. The oil pan has year differences as the Chevy V8. The 1996 & newer 4.3 blocks use an aluminum oil pan. **Vehicles requiring oil pan modifications using this block are not recommended.**

Motor mounts are also the same as the Chevy V8, with the exception of the location of the triangular bolt pattern in reference to the back of the block. The mount location on the V6 is approximately 4-1/2" closer to the backside of the block than on the V8.

The Chevy V6 is an excellent choice for a engine upgrade in Toyota vehicles. This engine offers a substantial power increase over the stock 4 cylinder and is easier on your stock drivetrain when utilizing your original manual transmission.

BUICK V6 BLOCKS:

The Buicks used two different bolt patterns. The 225, 231 and 3.8L (rear wheel drive vehicle) all used the standard Buick bolt pattern for which we offer adapters, motor mounts, and headers. Engine blocks like the 3.8L transverse (front wheel drive vehicle) have the same bolt pattern as the Chevy 2.8L V6. We do not offer any conversion components for these blocks. We get many requests to use the Buick 215 block; however, we do not offer adapters or motor mounts for the aluminum 215 block.

The Buick V6 provides an easy installation because of its size and nice fit into the Toyota 4WDs. The popularity of this conversions has declined in recent years due to popularity of Chevy V6 and V8 engine conversions.

FORD V8 BLOCKS:

Ford conversions are becoming more popular. We do not offer any adapters to retain the stock 5 speed transmission in these conversions. We do, however, manufacture numerous adapters to couple Ford transmissions to your stock Toyota transfer case.

When selecting a Ford block, take the following information into consideration: Ford blocks used three different block bolt patterns. We only offer motor mounts and adapters for the small block Ford 289, 302, and 351W; the Ford 302 being the most commonly used block for conversions.

Small block Fords had the option of utilizing two different flywheel diameters. These flywheels can be identified by a tooth count of 157 tooth or 164 tooth. It is critical that you match the flywheel diameter with the proper bellhousing and dust cover shield. For example: A bellhousing designed for a 164 tooth flywheel cannot use a 157 tooth flywheel. Since the starter bolts and indexes directly onto the stock bellhousing, the starter would not properly engage the incorrect flywheel. Therefore, make sure you verify the compatibility of these components.



When obtaining your flywheel, you must also verify that the flywheel has the proper balance. Blocks 1982 & newer used a different weight for balancing than the earlier blocks. Some applications may require the flywheel to be rebalanced for the block.

When purchasing a Ford bellhousing, you should also consider your vehicle stock clutch linkage. Shown on this page are the two different Ford bellhousings having different provisions for clutch linkages. Ford used various hydraulic and mechanical linkages.



ENGINE CONVERSION

General Information

When converting your Toyota 4WD truck to a new engine there are a number of items that you must consider. The information listed in this section covers Toyotas 1979 to 1995. Most areas discussed in this section are categorized by either the year of the vehicle, stock engine that the vehicle was originally equipped with or stock transmission and transfer case. *Note:* Transmission and/or transfer case identification starts on **Page 14**.

A. BODY LIFTS:

1979-85: Although a body lift is not required to complete a conversion on these vehicles, we recommend that you consider a minimum 2" body lift in order to provide additional engine compartment and transmission tunnel area clearances. This will also provide additional clearance for the distributor cap.

1986-95: These vehicles were equipped with an I.F.S. suspension. It is mandatory that your vehicle be equipped with a body lift. A minimum 2" body lift will provide the necessary clearances for the transmission and engine to fit properly. Vehicles without a body lift will require extensive engine compartment modifications. *Note:* If a T.B.I. block from out of a truck is going to be used, a 3" body lift will be required for hood clearance.

B. SUSPENSION LIFTS:

1979-85: When performing an engine swap on your Toyota 4WD, we recommend that you install a suspension lift. The suspension lift will be an asset to your vehicle when performing these conversions. It provides your vehicle with better ground clearance and wheel travel. The suspension lift will provide additional clearance between the front driveshaft and starter motor assembly. The installation of a V6 or V8 engine will also add additional weight to the front of your vehicle. For instance, your 4 cylinder engine weighs about 300 pounds. A new V8 engine will weigh in the neighborhood of 575 pounds; and a new V6 approximately 450 pounds. A suspension lift will normally provide the additional support to handle these heavier engines. If a suspension lift is not used on these vehicles, a helper spring or stiffer leaf spring may be required.

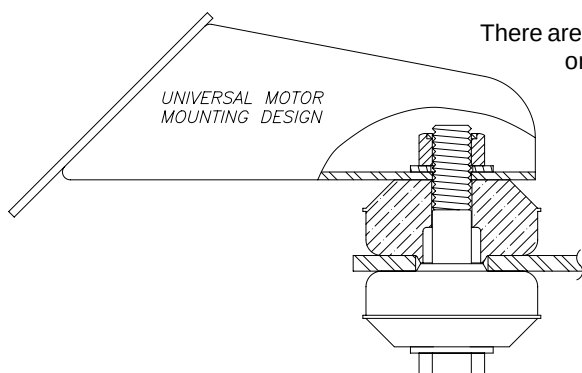
1979-81: On these year vehicles, Toyota utilized a front stabilizer bar. This bar attached to the front axle on the driver's side of the vehicle. When installing a V8, the mount where this bar attaches will need to be relocated or removed.

1986-95: When performing an engine swap on your Toyota 4WD with the I.F.S. suspension, we recommend that you install a suspension lift. When positioning a new engine into these vehicles, oil pan clearance is an issue. The easiest way to obtain the proper oil pan clearance is by installing a suspension lift. The suspension lift required for these year vehicles will drop the entire front axle away from the frame, providing the necessary clearances for all engine swaps. If you prefer to keep your vehicle at the stock height, we offer modified oil pans for both the Chevy V6 & V8 engines. *Note: Our oil pans will not fit Chevy blocks that were previously equipped with a stock aluminum oil pan.*



C. MOTOR MOUNTS:

Toyota used a straight axle on 4WDs 1979-85, and started using an independent front suspension (I.F.S.) on 1986 & newer vehicles. We offer motor mounts for various engine blocks. The proper engine mounts will depend on the front axle configuration of your vehicle. The mounts listed for the engines are to be used with both bellhousing and/or transfer case adapters.



There are two styles of engine mounts available. The first is the weld-in style that is used on vehicles equipped with a solid front axle. These mounts are fully adjustable and can be either welded or bolted to the inside of the frame rails. By having this adjustable option, you can position the engine so that driveline modifications can be eliminated on certain applications. The two mounts that extend outward from the engine block will usually need shortening in order to fit between the two frame rails. This may vary depending on the height of the engine.

The second style of engine mounts are the ones that bolt onto the existing 4 cylinder or V6 engine pads. These mounts have been designed for an engine location that cannot be varied. This type of motor mount is



mandatory on vehicles equipped with the independent front suspension. Motor mounts on these particular installations will normally allow you the ability to adjust the position of the engine correctly up to the original 5 speed tranny or to the popular TH350 & 700R-4 transmission options.

Our weld-in mounts are a complete frame-to-block setup, which includes the rubber insulators. Some of our bolt-in mounts will require the use of a stock GM engine rubber mount (GM# 3990914 or Sealed Power/Federal Mogul# 270-2267 Napa # 602-1106).



Chevy V8:

- P/N 713001-S** Chevy V8 mounts to Toyota 1979-85 (weld-in)
- P/N 713013** - Chevy V8 mounts to Toyota 1986-95 replacing a 4 cyl. (bolt-in)
- *P/N 713125** - Chevy V8 mounts to Toyota 1988-95 replacing a V6 (bolt-in)

Chevy 4.3 V6:

- P/N 713001-S** Chevy 4.3 V6 mounts to Toyota 1979-85 (weld-in)
- P/N 713013** - Chevy 4.3 V6 mounts to Toyota 1986-95 replacing a 4 cyl. (bolt-in)
- *P/N 713126** - Chevy 4.3 V6 mounts to Toyota 1988-95 replacing a V6 (bolt-in)

Buick V6:

- P/N 713011** - Buick V6 mounts to Toyota 1979-85 (weld-in)

Ford V8:

- P/N 713002-S** Ford V8 mounts to Toyota 1979-85 (weld-in)
- P/N 713016** - Ford V8 mounts to Toyota 1986-95 replacing a 4 cyl. (bolt-in)
(No mount is available when replacing a stock V6)



When using our bolt-in style mounts, the tab must be removed on the stock frame mounts.

*These mount kits provide new GM rubber mounts and a crossmember relocation plate. Driveline modifications will be required.

D. RADIATORS:

A new radiator is normally required when doing an engine swap. We offer a new high efficiency 4-core copper/brass radiator for the Chevy 4.3 V6 & V8 and a *Rad-A-Kool* 1-core aluminum radiator for Chevy V6 and V8s. These radiators are all a down-flow, core configuration and have the proper inlet & outlet location for these blocks. They come complete with a transmission cooler.

The *Rad-A-Kool* aluminum 1 core fits vehicles 1979-95, and is rated to cool engines up to 300 horsepower. This radiator is ideal for engine conversions that are tight on space and is your best choice on 1986-95 Toyotas using our bolt-in engine mounts.



Our 4 core copper/brass radiator, designed with 1/2" tubes on 3/8" centers. It is designed specifically for vehicles 1985 & newer. This radiator bolts into the factory location and extends 5" lower than stock. Since these radiators hang 5" lower than stock, you may want to fabricate a steel guard to protect your radiator. Angle iron provides a great solution to protect this lower portion. The original fan shroud should be retained but will require modifications. If you attempt to use this radiator on vehicles 1979-84, you will require modifications to the front crossmember core support. **NOTE: These radiators will not work with LT1 blocks.**



- P/N 716681** - Chevy V6 & V8 radiator (4-core)
(Radiator measures 3" thick, 24.25" tall,



24" wide)

V8 Upper and Lower Hose - #Universal 1-1/2" Flex hose

- P/N 716698-AA** - Chevy V6 & V8 1 core radiator w/ trans cooler (shown right)
- P/N 716698-AB** - Chevy V6 & V8 1 core radiator w/ out trans cooler
- P/N 716698A-LS / P/N 716698M-LS** - Chevy LS1 auto & manual single core radiator
- P/N 716698A-LT / P/N 716698M-LT** - Chevy LT1 auto & manual single core radiator
(Radiator measures 3" thick, 22.25" tall, 24" wide)

E. FAN:

On most conversions, you will be able to use a 16" conventional fan. When using a conventional fan, you will be limited on radiator clearance. To obtain additional clearance for the radiator, a short-style water pump could be used. Some of the newer blocks with the Serpentine belt system will usually allow enough radiator clearance to retain a conventional fan. Whenever a conventional fan is used, make sure you have adequate clearance for your radiator and proper shrouding for both airflow & personal protection.



When your engine position does not allow adequate clearance for a conventional fan, an electric fan is an ideal option. An electric fan can either be mounted in front or behind the radiator to maximize on space. Many manufacturers of electric fans offer slim designed fans to aid in this regard. We offer Spal fans which are a high performance, curved bladed pusher or puller. These 16" fans are 16.3" tall, 15.75" wide, and 3.39" deep at the fan motor. The fans are rated at 2070 CFM; and being that they are pre-shrouded, they are ideal for cooling larger engines. Our fan kits come complete with the needed wiring harness which is compatible with both positive and negative ground vehicles. The 3/8" pipe thread sending unit is designed to turn the fan on at 185 degrees and off at 170 degrees. The kit comes with a 40 amp relay,

a fuse holder, and all other necessary hardware. In addition, our kit also includes mounting brackets for the fan to the radiator. The mounting brackets are designed for our aluminum radiators; however, we can supply you with brackets to fit our copper/brass radiators upon request.

716670 - Puller Fan Kit

716671 - Pusher Fan Kit

F. OIL PANS:

On Toyota vehicles 1979-85 (equipped with the solid front axle), you will be able to use the stock engine oil pan without modifications. On 1986 & newer vehicles with the I.F.S. front axles, you have one of two options. The first option is to equip your vehicle with the recommended suspension lift, providing the necessary stock oil pan clearance. The second option would be to modify your stock pan. The entire bottom of the pan needs to be re-fabricated to fit and some grinding may be required on the front differential housing. You will also notice that there is limited clearance between the pan and differential. Even though clearance is limited, there should not be a concern in this area because both the engine & front axle mounts have very little movement. We did offer modified pans for several years, however, we no longer offer this product.



NOTE: Newer GM blocks equipped with the aluminum oil pan should not be used on vehicles that do not have a suspension lift. Modified oil pans are not available for these engines. Starter clearance with the oil pan can also be an issue with these blocks.

G. OIL FILTER:

The original Chevy V6 or V8 oil filter can be retained. On some installations, we have had customers use a remote oil filter adapter in order to provide additional clearance for their exhaust system on the driver's side.

Since the oil filter connection on a Ford block protrudes towards the driver's side frame rail, a remote oil filter adapter is required. We offer a remote filter adapter, **P/N 716084**, that provides the oil line connections at a 90 degree angle. This type of adapter provides the greatest amount of clearance for the Ford block.





P/N 717011



Left photo is P/N 717054. Right photo shows the tight clearance on the 717056 header with our bellhousing. A muffler shop can fit the exhaust by the slave cylinder and fork, but it is a tight fit. A heat shield should be made to protect the slave cylinder.



H. EXHAUST HEADERS / STOCK MANIFOLDS:

On most conversions, you will have the option of using a custom exhaust header or stock manifold. If headers are to be used, you will need to verify your State's emission requirements since the headers we supply are not smog legal. The following conversion headers are for V6 & V8 blocks. Our headers are designed around conversions using our motor mounts. Due to vehicle variations, some modifications may be required when using our exhaust header systems. These headers are available in chrome or Non-plated (NP).



P/N 717056

- P/N 717011** - Chevy V8 center dump headers (vehicles 1979-85 only)
- *P/N 717053** - Chevy V8 rear dump manifold style headers (for vehicles replacing a stock V6)
- *P/N 717054** - Chevy V8 rear dump manifold style headers (for vehicles replacing a 4 cylinder)
- P/N 717056** - Chevy 4.3 V6 headers (vehicles 1979 & up) *(Manual trannys require clutch arm mods.)*
- *P/N 717041** - Buick V6 headers (vehicles 1979 & up)
- P/N 717012** - Ford V8 center dump headers (vehicles 1979-85 only)
- *P/N 717044** - Ford V8 rear dump manifold style headers (vehicles 1979 & up)
- *Headers will have interference problems with the release arm when used with a manual transmission.**

Smog legal vehicles will normally require you to retain the stock manifolds. On GM V8 installations, the stock manifolds from a 1982 & newer low performance car engine work the best. These manifolds can normally be installed without any modifications. For Chevy V6 installations, the manifolds from a 1985 Chevy full size truck are an option. You can also try manifolds off of a 1980 Monte Carlo equipped with a 3.8 V6. On Ford V8 conversions, the early Maverick manifolds work well; however, they do not have smog connections. We have been told that the exhaust manifolds from a V8 Ford Explorer will fit with only minor modifications required. On the Buick V6, manifold #25507801 and #1250528 should be used.



NOTE: All of the stock manifolds suggested above were obtained from customers that have completed the various conversions. We have not personally verified the fit of these manifolds into these Toyota conversions.

I. FUEL PUMP:

A carbureted block can have fuel supplied to the new engine in two ways: an electric fuel pump or a mechanical fuel pump. The mechanical pump is normally part of the engine and, at times, does create some clearance problems. When a mechanical pump cannot be used, the alternative is an electric pump. Most carbureted blocks require a fuel pressure rating of 5 to 7 PSI.

Fuel injected blocks require a higher fuel pressure. These blocks can use the stock fuel pump that your vehicle was equipped with, provided it has the correct PSI rating to match your engine. If this is not an option, you can install an in-line fuel pump with the correct PSI rating to match your block. This pump should be added slightly ahead of the fuel tank. When using an aftermarket electric fuel pump, you should also incorporate a safety circuit to turn off the fuel pump if the engine were to stall.

Whether your new engine is carbureted or fuel injected, and you use either a mechanical or aftermarket electric fuel pump, the stock fuel pump located in the fuel tank should not have to be removed.

J. ALTERNATOR:

When replacing a 4 cylinder or V6 engine, we recommend that you purchase a new V8 alternator with an internal regulator to provide better charging to your electrical system. When wiring the new alternator, you must remove the original Toyota regulator.

- | | |
|-----------------------|------------------------------|
| GM Alternator Bracket | GM #14081227 (Adjuster) |
| GM Alternator Bracket | GM #14015533 (Front Bracket) |
| GM Alternator Bracket | GM #6262934 (Spacer) |

If you elect to use the GM alternator that is equipped with a built in regulator, you will need to change the wiring. Remove the existing Toyota regulator and cut the wires that feed the regulator. These wires will be the source of power to your new GM alternator. The

large 10 gauge will need to be extended to the large post on the back side of the new alternator. You will then need to determine which of the small wires is hot when the ignition switch is on. The hot wire will then need to be extended to reach the number 1 terminal on the GM alternator. You must then install a jumper wire between the 10 gauge terminal and the number 2 terminal. Use the original GM plugs to make sure the connections are properly fitted.

K. PULLEY SYSTEM:

The belt system required to drive the alternator, water pump, power steering, and air conditioning can all be accomplished with a two belt system. If a three belt design is attempted, you will find that the length is too critical for radiator clearances. With the two belt system, you will be able to drive the alternator, water pump, and crank on one; the air conditioning, water pump, and crank on the other. Make sure that the air conditioning and alternator brackets are adjustable. The Serpentine belt system found on newer motors also works excellent.



L. WATER PUMPS & THERMOSTATS:

Chevy engine installations have the option of either a long or short water pump. The long style water pump is most commonly used on Chevy blocks. The stock bracketry on most V6 & V8s is designed to be used with a long style water pump. A short water pump will give additional radiator clearance; however, accessory brackets are sometimes hard to come by. We offer a high performance brand of water pumps and thermostats for Chevy V6 & V8 conversions.

On Chevy & Ford blocks with a Serpentine belt system, these blocks can usually retain this stock belt system. They will normally provide sufficient clearance for your radiator. Be careful if you replace the

water pump on a Serpentine system since they usually rotate in the opposite direction.



FLOWKOOLER Pumps:

P/N 25-1668 - GM short water pump (1955-91 Chevy). This water pump is 5-11/16" long.

P/N 25-1759 - GM long water pump (1955-91 Chevy). This water pump is 6-15/16" long.

FLOWKOOLER Thermostats:

P/N 25-1600 - 160 degree high flow thermostat

P/N 25-1800 - 180 degree high flow thermostat

(All brass and copper construction with a "balanced sleeve")



GM short style water pump

M. POWERSTEERING:

You can utilize your original stock power steering pump by fabricating a mounting bracket to fit your new block. The original hoses can usually be retained without modifications if the stock pump is retained with a custom fabricated bracket. However, we recommend utilizing a stock power steering pump and bracket from the engine that you are installing.

For example: When installing a Chevy V8, you would use a standard GM power steering pump. The only modification needed would be to couple the GM pump to the Toyota box. This can be accomplished by having a custom power steering hose made in which one end is a Chevy fitting to fit the pump, and the opposite end is equipped with a fitting for the Toyota box. This installation would only require one custom hose - which is the pressure hose. The return line is simply a rubber hose with steel fittings couple together with hose clamps. This same procedure will work for Chevy V6, Buick V6, and Ford V8 installations.

N. AIRCONDITIONING:

Toyota used three different types of air conditioning compressors. Each type of compressor will require a custom bracket to be made for your new engine. We recommend that the compressor be located on the passenger side so that the original A/C lines can be retained without modifications. If you don't want to fabricate your own brackets, a simpler way is to retain the air conditioning compressor on the new engine. The stock Toyota air conditioning lines can be spliced to the new engine A/C lines very easily. Check with your local automotive parts store for an A/C splice kit. This eliminates any requirement for custom compressor bracketry.

O. FLYWHEELS & STARTER MOTORS:

The starter motor must match the flywheel that you have on your engine.

GM engines: You will be able to use either a 153 tooth & 168 tooth flexplate.

Buick engines: On both automatic and manual applications, you will be limited to a 160 tooth flywheel/flexplate.

Ford engines: On Ford blocks, you will be able to use either a 157 tooth or 164 tooth flywheel/flexplate.

Depending on your application, it is critical that you properly match the starter and the flywheel. On Ford applications in particular, the bellhousing must also be matched. For GM applications using a 168 tooth flywheel, use starter #3510 or GM# 1108400. For GM applications using a 153 tooth flywheel, use starter #3631 or GM# 1108789. These starters can sometime cause exhaust clearance problems. For a trouble free application, a gear reduction starter is ideal because of its size. For Buick applications, use Delco# 1968122; and on Ford applications, the standard starter to match your bellhousing and flywheel will work fine.

P. GAUGES:

When converting to a V6 or V8, you must use the stock sending units. These units will be compatible with your stock Toyota gauges. Since the oil pressure and engine temperature sensors have a metric thread, you will need to use a special bushing in your new manifold for adapting to these metric threads. These items are available from your local automotive parts. Stewart Warner fittings are normally the easiest to work with.

If your vehicle is equipped with a factory tachometer, you will have two options: You can buy an after market tachometer or you can re-calibrate your stock one. When swapping a Chevy or Buick V6 into vehicles that were originally equipped with a V6, no modifications to your tachometer will be required. On Chevy, Ford or Buick engine swaps, your tachometer will run anywhere from 50% and up off of calibration. To re-calibrate your tachometer, a trip to your local electronic store will be necessary. By purchasing a 5K OHM trim potentiometer, you will be able to fine tune your tachometer. The Toyota tachometers accept a pulse ignition signal from the coil and converts it into a proportional DC signal that drives the meter in the dash. By adding the potentiometer in line with the tachometer input wire, you will be able to calibrate it by restricting its impulse signals. A small 10 turn potentiometer is the easiest to use for this calibration procedure.

Q. IGNITION SYSTEM:

Once your conversion is complete, you will need to rewire your ignition system. Below, we have listed the two types of ignition systems that you could have used when installing a new engine.

Ignition: Your new engine can be equipped with either a "point-type" or an "HEI" type ignition. These will both fit into your vehicle, with only slight firewall modifications required on the HEI distributors. When using the HEI distributor, the hot wire from the ignition will plug directly into the distributor battery terminal. If you are attempting to install a fuel injected or throttle body motor into your vehicle, then we recommend that you purchase a Toyota Service Manual to help you identify the existing wiring system for compatibility with the new engine.

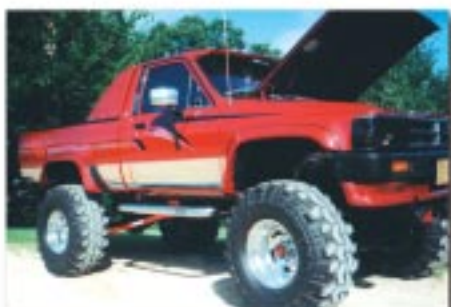
What you will need to do is locate the yellow wire that was originally attached to the positive side of your stock coil. This is the hot wire that will feed your new GM ignition system. If you are using a point-type distributor, you will need to install an external resistor that is compatible with your new coil and distributor. If you are using an HEI system, this same yellow wire will need to be attached to the electronic control unit which will then attach to the positive side of the ignition coil.

Charging System: The power source for your vehicle is referred to as the charging system. It is imperative that you have this system wired correctly so that your battery will be recharged, and you will be able to operate all of your electronic accessories. Since you are replacing a 4 cylinder engine and installing a V6 or V8 engine, you will need to install a new battery with the required cold cranking power needed for your engine. A typical V8 requires a rating no lower than 550 amps. If you are using your stock alternator along with a new starter, your stock wires will simply attach to the new starter. **NOTE:** When using a V8, you should use at least a 90-100 amp alternator. Your alternator will already be wired correctly. However, if you are installing a new GM alternator, you will need to locate the correct wires for supplying the power to the new alternator.

R. WIRING:

When it comes to computer controlled engine blocks, there are many aftermarket sources. We have listed two sources that manufacture conversion wiring harnesses:

Howell Engineering	(810) 765-5100	G.M. wire harnesses
Street & Performance	(501) 394-5711	G.M. & Ford wire harnesses
Speed Scene Wiring	(210) 651-1894/1895	G.M. wire harnesses



1982 Toyota truck with a 355 small block

TOYOTA 4WD TRUCKS & 4-RUNNER BELLHOUSING ADAPTERS (Retaining your stock transmission)

Toyota 4WD engine conversions are extremely popular. Whether you are retaining the stock transmission or converting to a Chevy or Ford transmission, we offer the necessary adapters. This section will cover adapters required when retaining the stock transmission.

To select the correct adapters necessary to complete your conversion, you should first identify your drivetrain. Since there are different bolt patterns found on Toyota transmissions, there will be some stock transmissions we do not offer adapters for. We have listed the stock transmission codes to aid in the identification process. These transmission codes are normally found in the engine compartment on vehicles 1979 to 1983, or on the driver's side door jam on 1984 & newer vehicles.

The bellhousings we manufacture adapt the Toyota 5 speed to the popular Chevy V6 & V8, and Buick V6 engines. The transmissions we do not offer any bellhousing adapters for are the 4 & 5 speed transmissions (1979-83), with tranny codes L43, L45, L50, and L52. The L43 & L45 4 speeds were only used for a short time and not strong or popular enough to warrant an adapter. The L50 & L52 5 speeds were an integral (one piece) bellhousing and transmission, which makes it very difficult to adapt to.

MANUAL 5 SPEEDS (1979-1983):

In order to adapt your 5 speed transmission to the Buick or Chevy engine, your 5 speed transmission must have been originally equipped with a removable bellhousing. Between 1979 & 1983, Toyota used various models of 5 speed transmissions. These early 5 speeds are considered very weak transmissions and are not compatible for use with a new engine conversion installation. The best solution on these vehicles is to convert to either a GM or Ford automatic or manual transmission. If you prefer to keep a Toyota 5 speed, then you could obtain a transmission from a later model Toyota truck. When Toyota introduced their fuel injected trucks in 1984, they increased the strength of the 5 speed. If you have access to one of these later model 5 speed transmissions with the removable bellhousing, then you could interchange to one of these later model transmissions. You will, however, have driveshaft modifications. If you decide to use a later model 5 speed, be aware that vehicles equipped with the turbocharged 4 cylinder or 3.0L V6 engine were equipped with either a different transfer case or spline count.

MANUAL 5 SPEEDS (1984-1995):

These transmissions can be identified by transmission codes **G52, G54, W56 & G58**. These transmissions were normally coupled to a Toyota 4 cylinder engine. They all have the same bolt pattern, input spline, and input shaft length. These 5 speeds hold up very well to the V6 engines, but can be marginal for V8 installations. The overall assembly length of the stock transmission and bellhousing is 25-3/8". Applications retaining these 5 speeds normally will not require driveline modifications.



We manufacture a new 360 degree aluminum bellhousing that bolts directly to a Chevy or Buick engine block and accepts the original Toyota 5 speed transmission, **P/N 712560**. This bellhousing is designed to work with a 10-1/2" flywheel & clutch assembly. A standard Chevy starter for the 10-1/2" flywheel will work in this bellhousing. If your engine of choice only had a 168 tooth flywheel option, our bellhousing will fit the larger diameter flywheel; however, you must use a hi-torque starter that does not have a nose cone. Engine blocks that may require the use of the 168 tooth flywheel are the late model 4.3 V6s. We offer a new hi-torque starter for these engines. **Part No. 22-0001** fits both the 4.3 V6 and Chevy V8 blocks.

These Toyota 5 speeds use a dowel pin alignment when connecting to a bellhousing. When installing one of our conversion bellhousings, it is imperative that the two dowel pins be retained on the 5 speed for properly indexing. Your 5 speed transmission will retain the stock input shaft bearing retainer. This retainer provides the collar for the release bearing. The diameter of this retainer is identical to a Chevy, thus allowing you to use a stock Chevy release bearing.

Each bellhousing kit is furnished complete with a dust cover, custom pilot bushing, modified release arm, ball pivot, and necessary hardware. This kit does not include a clutch disc, slave cylinder, release bearing, and pressure plate. The items must all be purchased separately. The Toyota input shaft has a 1-1/8"-21 spline, requiring a special clutch disc. Centerforce Clutches manufactures for us a special 10-1/2" clutch disc with a 1-1/8"-21 spline, **P/N 716105**. This disc will work on a stock 10-1/2" 153 and 168 tooth Chevy flywheel or a 10-1/2" 160 tooth Buick flywheel. This bellhousing was also designed to work with the Centerforce high diaphragm pressure plate, **P/N CF360056** (10-1/2") or **CF165552** (11"). These pressure plates provide ample clearance in our bellhousing and work well with the Toyota Land Cruiser slave cylinder used in this conversion. The clutch release mechanism is designed to use a Toyota Land Cruiser slave cylinder. This slave cylinder bolts directly to the side of our bellhousing and connects to a modified GM cast iron release arm. We carry this Land Cruiser slave cylinder under **P/N 716213**. When purchasing the Centerforce clutch components, you will also be required to purchase a flat-face release bearing, **P/N N1430**.

MANUAL 5 SPEEDS (1986-1995):

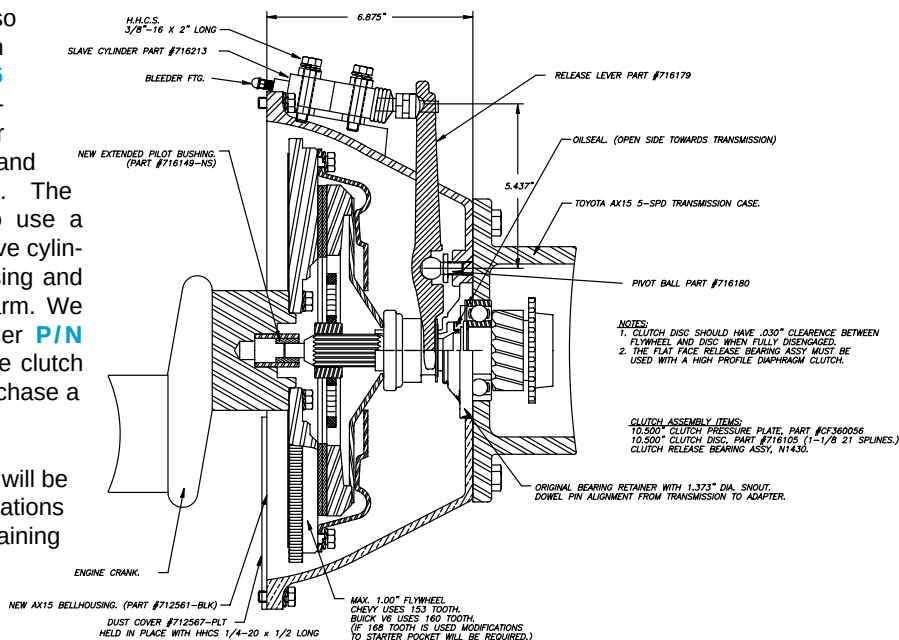
These transmissions can be identified by transmission codes **R150F** and **R151F**. The R150 transmission is normally coupled to the 3.0 Toyota V6, and the R151F is coupled to the turbocharged 4 cylinder. Both of these transmissions have the same input shaft length, spline, and bolt pattern. We manufacture one bellhousing that will adapt these two transmissions to a Chevy 4.3 V6, V8, and Buick V6.

Our new 360 degree aluminum bellhousing, **P/N 712561**, bolts directly to a Chevy or Buick engine block and accepts the original Toyota 5 speed transmission. This bellhousing is designed to work with a 10-1/2" flywheel & clutch assembly. A standard Chevy starter for the 10-1/2" flywheel will work in this bellhousing. If your engine of choice only had a 168 tooth flywheel option, our bellhousing will fit the larger diameter flywheel; however, you must use a hi-torque starter that does not have a nose cone. Engine blocks that may require the use of the 168 tooth flywheel are the late model 4.3 V6s and the new Vortec blocks. We offer a new hi-torque starter for these engines. **Part No. 22-0001** fits both the 4.3 V6 and Chevy V8 blocks.

These Toyota 5 speeds use a dowel pin alignment when connecting to a bellhousing. When installing one of our conversion bellhousings, it is imperative that the two dowel pins be retained on the 5 speed for properly indexing. Your 5 speed transmission will retain the stock input shaft bearing retainer. This retainer provides the collar for the release bearing. The diameter of this retainer is identical to a Chevy, thus allowing you to use a stock Chevy release bearing.

Each bellhousing kit is furnished complete with a dust cover, custom pilot bushing, modified release arm, ball pivot, and necessary hardware. This kit does not include a clutch disc, slave cylinder, release bearing, and pressure plate. The items must all be purchased separately. The Toyota input shaft has a 1-1/8"-21 spline, requiring a special clutch disc. Centerforce Clutches manufactures for us a special 10-1/2" clutch disc with a 1-1/8"-21 spline, **P/N 716105**. This disc will work on a stock 10-1/2" 153 and 168 tooth Chevy flywheel or a 10-1/2" 160 tooth Buick flywheel. This bellhousing was also designed to work with the Centerforce high diaphragm pressure plate, **P/N CF360056** (10-1/2") or **CF165552** (11"). These pressure plates provide ample clearance in our bellhousing and work well with the Toyota Land Cruiser slave cylinder used in this conversion. The clutch release mechanism is designed to use a Toyota Land Cruiser slave cylinder. This slave cylinder bolts directly to the side of our bellhousing and connects to a modified GM cast iron release arm. We carry this Land Cruiser slave cylinder under **P/N 716213**. When purchasing the Centerforce clutch components, you will also be required to purchase a flat-face release bearing, **P/N N1430**.

When retaining the R150F transmission, you will be required to modify your driveshafts. On applications replacing the turbocharged 4 cylinder and retaining the R151F transmission, driveshaft modifications may or may not be required.



CLUTCH COMPONENTS:

The bellhousings listed above are designed for a 10-1/2", 153 tooth clutch and flywheel assembly. Since some of the later model GM blocks only have a 168 tooth flywheel option, we also provide our bellhousings with clearance to accept a 168 tooth flywheel and clutch components. The only requirement when using a 168TH flywheel is that a hi-torque starter with no nose cone must be used. In addition, The bellhousing kits are slightly different. The bellhousing kits should have a "V" added to the kits listed above. **P/N 712560V or P/N 712560V.**

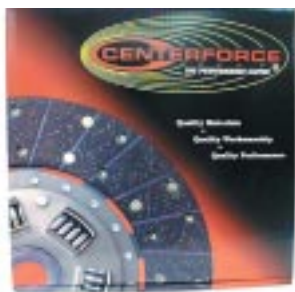
AUTOMATIC TRANSMISSIONS:

Toyota used a 4 speed overdrive automatic transmission in some of its models. This transmission was coupled to a unique transfer case. Unlike the transfer cases found coupled to the manual 4 & 5 speeds, this transfer case is impossible to convert to. We attempted to adapt a TH350 to this special transfer case and found that the internal parts were not compatible. With no success in retaining this transfer case, we decided in 1993 to introduced a new bellhousing kit to retain both the transmission & transfer case. However, this transmission is completely computer controlled. The complicated computer controls that were integrated with the stock engine computer system made it nearly impossible to retain this drivetrain. Therefore, we discontinued the production of this kit.

If your vehicle was equipped with an automatic transmission and you are going to do an engine conversion, the only solution is to purchase a stock Toyota gear-driven transfer case. These transfer cases are readily available from most salvage yards. By using this type of transfer case, you can adapt to a Chevy or Ford transmission. For transfer case identification, refer to the Transfer Case section of the manual. Replacing the Toyota automatic transmission will usually require you to perform driveshaft modifications.

CLUTCH COMPONENTS

Centerforce Clutch Components: In order to use the hydraulic clutch control mechanisms, you must make sure that your clutch is a high diaphragm design. The recommended clutch size is 10-1/2" for both the Chevy and Buick installations. The Centerforce clutches and flywheels listed below are the recommended components when using our bellhousings. We design our adapter kits around the Centerforce clutch design. *If clutch components from other manufacturers are used, we cannot guarantee proper clutch operation.*



For transmission conversions that are retaining the original 5 speed, it is recommended that you use a 10-1/2" clutch with a 153 tooth flywheel. Some later model Chevy blocks only came with a 168 tooth flywheel option. Our bellhousing can be used with this larger flywheel; however, a hi-torque starter without a nose cone is required. On Buick V6 conversions, the flywheel will be 10-1/2" 160 tooth. For conversions using a new transmission, you will be able to use either size flywheels.

Clutch assembly:

- P/N CF360056** - 10-1/2" High profile pressure plate
- P/N CF165552** - 11" High profile pressure plate
- P/N 716105** - 10-1/2" 1-1/8" 21 spline clutch disc
- P/N N1430** - Flat-face throw out bearing
- P/N 716231** - Clutch alignment tool 1-1/8" 21 spline

Flywheels:

- P/N CF700100** - 153 tooth GM flywheel (up to 1985 blocks)
- P/N CF700170** - 153 tooth GM flywheel (1986 & up blocks)
- P/N CF700120** - 168 tooth GM flywheel (up to 1985 blocks)
- P/N CF700160** - 168 tooth GM flywheel (1986 & up blocks)
- P/N CF700010** - 160 tooth Buick flywheel (flywheel should be balanced to crank.)

Starters:

- P/N 22-0001** - Hi torque starter (no nose cone) Chevy V6 & V8s
- P/N 22-0003** - Hi torque starter (no nose cone) 153T flywheels



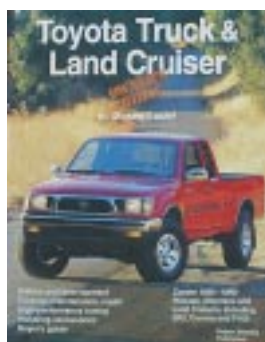
Slave Cylinder: We have designed our new bellhousing assembly around the exclusive use of a Toyota Land Cruiser slave cylinder assembly. This slave cylinder, **P/N 716213**, is not furnished with the adapter bellhousing and can either be purchased separately from us or from your Toyota dealership under Part No. 31470-60022. This slave cylinder will bolt directly onto the new bellhousing. The stock Toyota Land Cruiser push rod cannot be used; however, our bellhousing kits come with a new adjustable push rod for the slave cylinder. The fitting size on the Land Cruiser slave cylinder will interchange directly with the original Toyota master cylinder clutch line.

Note: The stock Toyota master cylinder has a cylinder bore of .625". The stock Toyota slave cylinder, which couples to the master cylinder, has a cylinder bore of .8125". The new Land Cruiser slave cylinder has a cylinder bore of .750". This new Land Cruiser slave cylinder will actually obtain more throw than the stock Toyota slave cylinder.

P/N 716213 - External Slave Cylinder (Toyota No. 31470-60022)



Driveshafts: Whenever possible, we have designed our bellhousings and transmission-to-transfer case adapters using a length that is compatible with the existing transfer case location. By leaving the transfer case in the original location, driveline modifications can be eliminated. On vehicles using the original 5 speed transmission replacing the stock 4 cylinder (carbureted or EFI), driveshaft modifications can usually be avoided. Vehicles replacing the stock V6 and retaining the 5 speed will require driveshaft modifications. Vehicles replacing the turbocharged 4 cylinders may or may not need driveshaft modifications.



TOYOTA OWNERS BIBLE by Moses Ludel

Part # TLCB

The Toyota Truck Owners Bible is a great addition in educating yourself regarding your vehicle. The book is a hands-on guide to getting the most from your Toyota.

High-performance modifications, accessories, vehicle history and tips you should know when buying a new or used vehicle, are just a few of the many topics covered by the well known technical writer Moses Ludel.



TRANSFER CASE IDENTIFICATION

Throughout the years Toyota used basically two types of transfer cases: chain or gear-driven. All gear-driven cases have the same bolt pattern with a 2.28:1 low gear ratio. They did, however, use two input splines which were 21 and 23. The chain-driven transfer case offered two input splines which were 23 and 26. The bolt pattern on these cases differed from the gear-driven transfer case. These chain-driven transfer cases have a 2.57:1 low gear ratio. This section first helps you to identify your transfer case. In addition, it will cover the modifications necessary when installing a different transmission or the Trail Tamers gears. One of the easiest ways to identify the difference between a chain or gear-driven transfer case is by looking under your vehicle. The transfer case rear cover is either bolted on with 5 bolts (chain) or 7 bolts (gear).



Gear-driven T/C



7 bolts (gear T/C)



Gear drive T/C shifter



Chain-driven T/C



5 bolts (chain T/C)

For further assistance in identifying the different transfer cases Toyota used, we reference the stock transmissions use in these vehicles. These transmission codes are normally found in the engine compartment on vehicles 1979-83, or the driver's side door jam on vehicles 1984 & newer.

1979-1980 4-SPEED with GEAR-DRIVEN 21 SPLINE TRANSFER CASE:



The first Toyota 4WD was produced in 1979. 1979-80 vehicles used a manual 4 speed (tranny code L43). This transmission was coupled to a gear-driven 21 spline transfer case.

The input shaft on this transfer case was odd because it did not have a standard spline relief, as did all other Toyota 21 spline gear-driven transfer cases. On these transfer cases, some grinding is required on the input shaft for proper fit on our adapters. When adapting to this transfer case, the shifter linkage will stay mounted on the transfer case. If installing the *Trail Tamer* gears in this transfer case, you will be required to modify the shift forks. Some internal grinding on the case may be necessary for this gearing upgrades.

1981-1983 5-SPEED with GEAR-DRIVEN 21 SPLINE TRANSFER CASE:



1981-82 tranny code L45 4-speed, 1981-82 tranny code L50 5-speed and 1983 tranny code L52 5-speed. All three transmissions used in these years were all integral (one piece bellhousing and transmission). The overall length of these transmissions varied. When adapting a new engine & transmission on these year vehicles, driveline modifications should be expected. These transmissions were coupled to a gear-driven 21 spline transfer case.

Although there were three different transmissions used, there was only one model transfer case used. The transfer case shifter is mounted on the top of this transfer case. The gears on this transfer case are categorized as "noisy run gears". If installing the *Trail Tamer* gears in this transfer case, you will be required to modify the shift forks. Some internal grinding on this case will be necessary.

1984-1988 (Carbureted) 5-SPEED with GEAR-DRIVEN 21 SPLINE TRANSFER CASE:



1984-88 tranny G52 & G54 5-speed. These transmissions were normally coupled to a carbureted 4 cylinder. These transmissions offered a removable bellhousing, allowing these transmissions to be retained for engine swaps. These transmissions were coupled to a gear-driven 21 spline transfer case.

Although there were two different transmissions used in these years, only one model transfer case was used. The transfer case shifter was mounted on the stock 5-speed tailhousing. Our transfer case adapters will allow you to retain this same transfer case shifter configuration. This transfer case also used a retainer clip to secure the two front bearings. This clip must be removed when using one of our adapters. If installing the *Trail Tamer* gears in this transfer case, some internal grinding on the case may be necessary.

1985-1988 (E.F.I. 4 cylinder) 5-SPEED with GEAR-DRIVEN 21 SPLINE TRANSFER CASE:

1985-88 tranny code *W56* 5 speed. This transmission was normally coupled to an electronic fuel injected 4 cylinder. The bellhousing on this transmission is removable, allowing this transmission to be retained for engine swaps. This transmission was coupled to a gear-driven 21 spline transfer case.

The transfer case shifter linkage is mounted on top of the transfer case. Since it has “quiet run gears” and the correct transfer case shifter configuration, this box is the best suited transfer case to use for a donor Crawler unit. If installing the *Trail Tamer* gears in this transfer case, you will need to modify the shift forks. Some internal grinding on the transfer case may be necessary for this upgrade. This transfer case also used a retainer clip to secure the two front bearings. This clip must be removed when installing one of our transfer case adapters.

1989-1995 (E.F.I. 4 cylinder) 5-SPEED with GEAR-DRIVEN 21 SPLINE TRANSFER CASE:

1989-95 tranny code *W56* 5 speed. This transmission was normally coupled to an electronic fuel injected 4 cylinder. The bellhousing on this transmission is removable, allowing this transmission to be retained for engine swaps. This transmission was coupled to a gear-driven 21 spline transfer case.



In 1989, the transfer case shifter linkage was relocated on the 5 speed tailhousing. The shifter mechanism for both the transfer case and the transmission were one unit. When using this transfer case with any of our transfer case adapters, you must either modify or replace your transfer case. By changing the shifter rods from a 1984-88 (Carbureted 4 cyl.) transfer case or using Toyota part numbers 36314-35020 (high-low rod) and 36313-35020 (front drive rod), you will be able to retain your stock transfer case. The other option is to purchase a 1984-88 (Carbureted 4 cyl.) transfer case.

This transfer case also used a retainer clip to secure the two front bearings. *This clip must be removed when using one of our transfer case adapters.* If installing the *Trail Tamer* gears in this transfer case, some internal grinding on the case may be necessary.

1986-1987 (Turbo E.F.I. 4 cylinder) 5-SPEED with GEAR-DRIVEN 23 SPLINE TRANSFER CASE:

The transmission code is *R151F*, and this unit is used in conjunction with the turbocharged 4 cylinder. This 5-speed has a removable bellhousing, allowing this transmission to be retained for engine swaps. This transmission was coupled to a gear-driven 23 spline transfer case.



This transfer case is identical to the 21 spline transfer case, except Toyota used a larger diameter 23 spline input. This input can be interchanged with any of the 21 spline cases. On high horsepower engines or vehicles with large tires, you can interchange this 23 spline input into a 21 spline case if you are concerned about strength. The transfer case shifter is located on the transmission tailhousing. Our adapter housings will allow you to retain this shifter configuration.

This transfer case also used a retainer clip to secure the two front bearings. *This clip must be removed when using one of our transfer case adapters.* If installing the *Trail Tamer* gears in this transfer case, some internal grinding on the case may be necessary.

CHAIN-DRIVEN 23 SPLINE TRANSFER CASE 1988-1994:

In 1988, Toyota introduced a different style of transfer case, changing to a chain-driven design. This 23 spline transfer case is most common in late model Toyotas and is normally used in conjunction with a V6 engine. The transmission code is *R150F*.

This transfer case is completely different than the gear-driven version. You can identify this transfer case by the number of bolts (5 bolts) that hold the rear tailhousing to the main case. The adapter selection to retain this transfer case is not as extensive as is our gear-driven transfer case options. Driveshaft modifications are normally required. **No reduction gears are available for this style transfer case, nor do we offer any crawler box be installed in front of this unit.**



CHAIN-DRIVEN 26 SPLINE TRANSFER CASE 1989-1995:

This 26 spline transfer case is not real common. It is normally found in Toyotas with 4 cylinders having a transmission code of **G58**. This vehicle also has a vacuum disconnect differential (VDD). The shifter handle for this chain-driven transfer case is found on the transmission tailhousing. Our adapters do not have provisions for this shifter configuration. Therefore, if you are using this transfer case with our adapter, you must change the transfer case shift rails and top cover. Driveshaft modifications are normally required. **No reduction gears are available for this style transfer case, nor do we offer any crawler box be installed in front of this unit.**

Transfer Case Support:

The transfer case support runs directly underneath the transfer case. Depending on the transmission you plan on installing and the transmission you are removing will determine whether or not the crossmember support will need to be relocated and if driveline modifications are required. Most Toyotas have a boxed-in frame rail which makes it difficult to move the crossmember back if needed. On conversions requiring the transfer case to be relocated further back, we offer an adjustable crossmember plate to assist you. This plate can be ordered under **P/N 713125-C**.

Toyotas that were originally equipped with a V6 engine will require crossmember modifications. When using our motor mounts, we provide **P/N 713125-C** which is an extension plate that bolts directly between the transfer case and crossmember. Some floorboard modifications on these vehicles are also necessary for the transfer case shifter handle.



Toyotas 1984-95, originally equipped with a 4 cylinder, had a stock drivetrain length of approximately 25-3/8". When installing a new transmission and transfer case adapter longer than the stock drivetrain, you may have driveshaft modifications. **Part No. 713125-C** can be used in the relocation of your stock transfer case. Floorboard modifications may also be necessary for proper clearance on the transfer case handle. On some applications, the engine can also be cheated forward to retain the transfer case in the stock location; however, radiator and fan clearance become an issue.

Toyotas 1979 to 1983, originally equipped with the 4 speed or 5 speed transmission varied in transmission lengths. When performing an engine and transmission conversion, most of these vehicles will be required to relocate the transfer case and have driveshaft modifications. **Part No. 713125-C** can be used to relocate your stock transfer case. Floorboard modifications may also be necessary for proper clearance on the transfer case handle. If you are using this plate, it will allow up to 6" of movement towards the rear axle.

Late model fuel injected application with dual T/C lever



T/C with short shift rods



T/C shifter assembly



Input shaft from a 1979-80 21 spline T/C with no spline relief



Later models with spline relief on input shaft

TRANSFER CASE ADAPTER SELECTION CHART

Before proceeding into this section, you should first identify your stock transfer case, noting any additional modifications that may be required when choosing a new transmission.

The quick reference chart below highlights the adapters we manufacture for the Toyota transfer cases to various aftermarket transmissions. The pages to follow will cover in more detail the proper transmissions to obtain, as well as the necessary modifications that will be required when converting them into your vehicle.

TOYOTA TRUCKS & 4 RUNNERS TRANSFER CASE ADAPTER SELECTION CHART	21 SPLINE T/C GEAR-DRIVEN 1979-95 4 cyl. HAVING STOCK TRANNY CODE L43,L45,L50,L52, G52,G54,W56	23 SPLINE INPUT GEAR-DRIVEN 1986-87 Turbo 4 cyl. HAVING STOCK TRANNY CODE R151F	23 SPLINE INPUT CHAIN-DRIVEN 1988 & Up V6 HAVING STOCK TRANNY CODE R150F	26 SPLINE INPUT CHAIN-DRIVEN 1989-95 4 cyl. VDD HAVING STOCK TRANNY CODE G58
AUTOMATICS				
GM TH350 4WD TRANS. CHEVY V6 & V8 CONVERSIONS 21.5" CASE LENGTH	50-5702 (5) 3.50" ADAPTER	50-5704 (5) 3.50" ADAPTER	50-3700 (3) 3.600" ADAPTER	50-3702 (3) 3.600" ADAPTER
GM TH350 2WD TRANS. CHEVY V6 & V8 CONVERSIONS 21.5" CASE LENGTH	50-5700 (3,5) 3.50" ADAPTER	50-5703 (3,5) 3.50" ADAPTER	50-3700 (3) 3.600" ADAPTER	50-3702 (3) 3.600" ADAPTER
GM TH350 2WD TRANS. BUICK V6 CONV. 1984 & UP 21.5" CASE LENGTH	50-5900 (1,5) 6.375" ADAPTER	50-5901 (1,5) 6.375" ADAPTER	50-3700 (3) 3.600" ADAPTER	50-3702 (3) 3.600" ADAPTER
GM 700R/4L60 O/D 4 SPEED 23.375" CASE LENGTH	50-5705 (3,5) 3.50" ADAPTER	50-5706 (3,5) 3.50" ADAPTER	50-3701 (3) 3.600" ADAPTER	50-3703 (3) 3.600" ADAPTER
GM 4L60E 2 & 4WD TRANS. 23.375" CASE LENGTH	50-5705 (3,5,7) 3.50" ADAPTER	50-5706 (3,5,7) 3.50" ADAPTER	50-3701 (3,7) 3.600" ADAPTER	50-3703 (3,7) 3.600" ADAPTER
GM 4L60E 2 & 4WD TRANS NOTE 4 W/REMOVABLE BELLHOUSING	50-0405 (4) 1.5" ADAPTER	50-0405 (4) 1.5" ADAPTER	50-0405 (4) 1.5" ADAPTER	50-0405 (4) 1.5" ADAPTER
FORD C4 3SD TRANS 11.180" CASE LENGTH	50-4400 (3,5) 8.25" ADAPTER	50-4401 (3,5) 8.25" ADAPTER		
FORD AOD AUTOMATIC 20.5" CASE LENGTH	50-4402 (3,6) 10.00" ADAPTER			
MANUALS				
FORD T18 4 SPEED 11.87" CASE LENGTH	50-5801 (3,5) 5.50" ADAPTER	50-5802 (3,5) 5.50" ADAPTER		
FORD NP435 4 SPEED 10.87" CASE LENGTH	50-5804 (3) 5.50" ADAPTER	50-5803 (3) 5.50" ADAPTER		
GM NV4500 4WD 31 SPL. 12.375" CASE LENGTH	50-0215 (2) 7.00" ADAPTER	50-0216 (2) 7.00" ADAPTER		
NV3550 TRANSMISSION 16.750" CASE LENGTH	50-1806A	50-1807A		
DUAL CRAWLER REDUCTION BOX 4.125" TOYOTA BOX	50-5905 2.375" ADAPTER	50-5906 2.375" ADAPTER		
TOYOTA R150F TO GEAR DRIVE T/C	50-5708	50-5707		
TOYOTA 23SP TO ATLAS TOYOTA TACOMA 26SP TO ATLAS	50-5710 Adapter kit to fit the 5 speed and automatic Tacoma transmissions 23sp. to an Atlas T/C. 50-5711 Adapter kit to fit the 5 speed and automatic Tacoma transmissions 26sp. to an Atlas T/C.			

NOTES:

- (1) THIS KIT USES A 2WD OUTPUT SHAFT (6" STICKOUT)
- (2) THE STOCK OUTPUT SHAFT MUST BE SHORTEND
- (3) THIS KIT COMES WITH A NEW OUTPUT SHAFT THAT MUST BE INSTALLED
- (4) THIS KIT REQUIRES THE USE OF A 700R KIT ALSO
- (5) IN VEHICLES 1984 & NEWER, THIS KIT NORMALLY WILL NOT REQUIRE DRIVESHAFT MODIFICATIONS
- (6) THIS KIT FITS 1988 & NEWER AOD TRANSMISSIONS. (IF YOU ARE USING A PRE-1988 TRANSMISSION, UPDATE KITS ARE AVAILABLE FROM YOUR FORD DEALER)
- (7) THIS KIT REQUIRES A RELUCTOR KIT, P/N 716073



P/N 50-5700

TRANSMISSION-to-TRANSFER CASE OPTIONS

When considering an aftermarket transmission, it is important to determine what type of transmission you require. We have listed these options to use as a guide in making your decision. We suggest that you make your choice depending on the way you drive and the age of your vehicle. We have listed only the transmissions that we offer adapters for. The standard modifications, gear ratios, and bolt patterns are also included in this section.

AUTOMATIC TRANSMISSIONS:

Both GM & Ford offer many automatic transmissions to choose from. The GM transmissions you can use are the TH350, 700R, 4L60 & 4L60E. The Ford transmission that you can use are the C4 and AOD. Automatic transmissions are excellent for 4WD conversions since they eliminate the need for clutch linkage modifications. The added length of the transmission can sometimes be limiting and, at other times, is an asset towards the elimination of driveshaft modifications. The automatics usually are equipped with only a 1st gear ratio of around 2.5 to 3.0-to-1. However, the automatic will not have the gear reduction hold-back that the manual truck transmissions provide. Nearly all of the transfer case adapters will require a new transmission output shaft to be installed. A cable operated shifter for the automatics is usually recommended. We carry the B & M sport shifter, **Part No. 715680** (cannot be used on vehicles with a forward console). We also carry the Lokar shifter which is a rod type linkage. These shifters can be purchased under **P/N 23-T350** (TH350 transmissions), and **P/N 23-R700** (700R transmissions). On certain installations, transmission pan modifications may be required for front driveshaft clearance.

If a automatic transmission is your choice of transmissions, there are always a few last minute items that need attention. One of these is the transmission cooler lines. You can surely bend up custom ridged cooler lines and route them up to the radiator. We've found that the ridged lines are sometimes a pain to fit properly. We now offer a flexible stainless steel hose kit. These hoses are simple to route and easily installed onto the radiator. The seven foot long hoses are long enough to fit most applications while having a bit of extra hose to allow for body and frame flex. Our kit includes two 7' stainless steel outer braid lines with Teflon inner tubing. The ends have dash 6 female A.N. fittings that are pre-crimped to the hose ends. The kit includes two 1/4" MPT to dash 6 Male fittings for aluminum Rad-a-kool radiators, and two 5/16" inverted flare to dash 6 Male fittings for TH350 / 700R4 transmissions. **P/N 23-1500**

When using any of the GM automatic transmissions, you will be required to make certain modifications for Toyota installations. When using the our "SlickFit" header system, you will find it necessary to trim the outer ears of the aluminum transmission case. This will allow for additional clearance of the exhaust system. A flexible transmission dipstick should be used on these installations. We recommend the Lokar product line (listed in our Buyer's Guide).



TH350:

This GM automatic was commonly found stock in vehicles from 1969 to 1981. It was used in both the 4WD pickups and 2WD car applications. These transmissions are identical except when it comes to the output shaft stickout length. The 4WD transmission used an adapter to bolt this transmission to its stock transfer case. With this adapter removed, the stock output shaft protrudes from the back of the transmission case approximately 1". On 2WD vehicles, these transmissions used 3 different tail housings. The lengths of these tail housings are 6", 9", and 12". The output shafts lengths correspond with these tailhousing lengths.

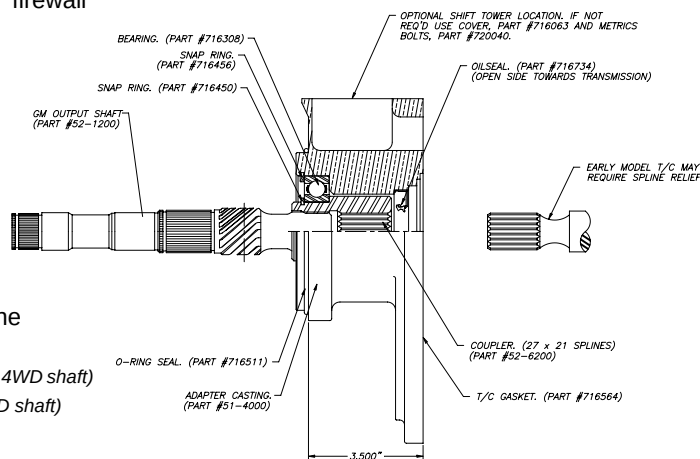
This tranny is one of the most popular choices for engine and transmission conversions due to an overall length of 21-1/2". The 1st gear ratio is 2.52:1; 2nd 1.52:1, and a 3rd gear ratio of 1:1. When converting with this transmission, we recommend that you cut the two tabs as illustrated. This allows for exhaust and firewall clearance.

TH350 Adapter Kits: We offer eight different adapters to couple the TH350 to the various Toyota transfer cases.

There are two kits available to install a Chevy V6 or V8 up to the 21 spline gear-driven transfer case. The reason for these two options is simple. Because of the various output shaft lengths, we have designed our kit around the TH350 4WD short output shaft. If you obtain a 2WD TH350, you will be required to install a 4WD version output shaft. The kits are identical except that one kit comes with a new 4WD output shaft and one does not.

P/N 50-5700 - TH350 to Toyota 21 spline T/C (with TH350 4WD shaft)

P/N 50-5702 - TH350 to Toyota 21 spline T/C (without 4WD shaft)



Two other kits are available to install a Chevy V6 or V8 up to the 23 spline gear-driven transfer case. The kits are identical except that one kit comes with a new 4WD output shaft and one does not.

P/N 50-5703 - TH350 to Toyota 23 spline T/C (with TH350 4WD shaft)

P/N 50-5704 - TH350 to Toyota 23 spline T/C (without 4WD shaft)

Two of the kits are designed to install a **Buick V6** in Toyota trucks 1984-95. These kits are identical except for the provisions to either the 21 or 23 spline gear-driven transfer case. The adapter housing used in these kits is 6-3/8" long. It provides the proper length to avoid driveshaft modifications. This kit uses a 6" output shaft stickout. The stock 6" shaft will need to be shortened. When installing a Buick V6 into vehicles earlier than 1984, the 50-5700 series kits should be used.

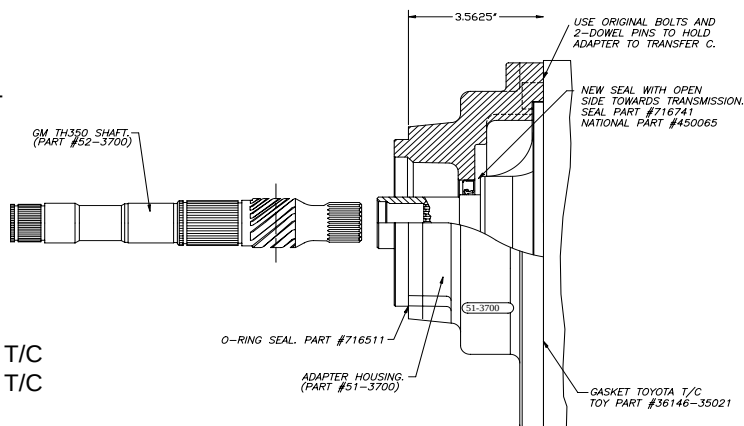
P/N 50-5900 - TH350 to Toyota 21 spline T/C

P/N 50-5901 - TH350 to Toyota 23 spline T/C

The last two kits are designed for the 23 & 26 spline chain-driven transfer case. These kits are identical except for the provisions to either the 23 or 26 spline shaft. The selection of your transmission (2WD or 4WD) for these adapters does not matter, since each kit is supplied with a custom output shaft. This shaft must be installed into your TH350 transmission prior to installation. The adapter length on this kit is approximately 3-5/8". Driveline modifications are required when using these adapters.

P/N 50-3700 - TH350 x Toyota 23 spl. chain-driven T/C

P/N 50-3702 - TH350 x Toyota 26 spl. chain-driven T/C



700R:

This is the first automatic overdrive that GM produced. Introduced in 1982, this transmission is offered in two different bellhousing / case designs (60 & 90 degree bolt patterns). All 4.3 V6 & GM V8 installations will require the 90 degree version. The internal components of these 700Rs can be interchanged if necessary. When this transmission was first introduced, it quickly developed a bad reputation for certain weaknesses. In 1987, GM resolved all of the problems that previously existed.

In the 1990s, the name of the 700R transmission changed to **4L60**. These transmissions are ideal for many conversions because of the 30% overdrive. The overall length of this transmission is 23-3/8". It has a 1st gear ratio of 3.06:1; 2nd 1.62:1, and 3rd gear ratio of 1:1. When converting using this transmission, we recommend that you cut the two tabs as illustrated in the TH350 section. This will allow for exhaust and firewall clearance. (Note: We offer a 700R lockup bypass kit, **Part No. 24-700R**).

When installing this transmission into Toyotas 1984 to 1995, replacing the 4 cylinder, you can eliminate driveshaft modifications by cheating the engine forward. On V8 installation, however, a short water pump may be required to accomplish this. For the ideal engine placement location, driveline modifications may be the better option.



For the 700R / 4L60, we offer two transfer case adapters for the gear-driven Toyota transfer case. These two kits are identical except that one kit fits the 21 spline transfer case input, and the other a 23 spline input. Both kits come with a modified 700R / 4L60 output shaft that must be installed into your transmission (2WD or 4WD).

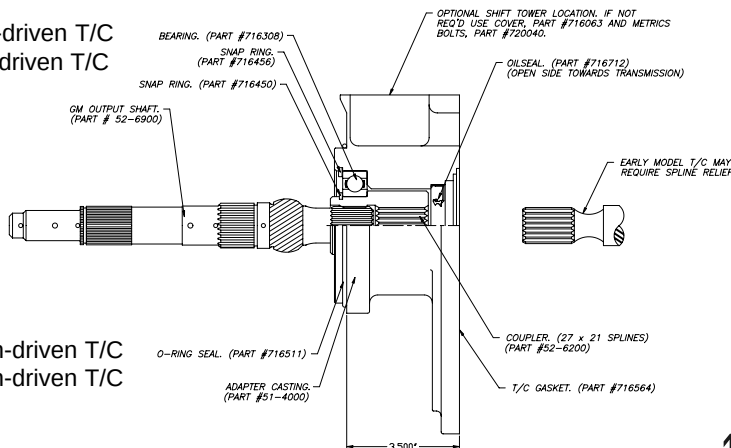
P/N 50-5705 - 700R / 4L60 to Toyota 21 spline gear-driven T/C

P/N 50-5706 - 700R / 4L60 to Toyota 23 spline gear-driven T/C

We offer two transfer case adapters for the chain-driven Toyota transfer case. One kit fits the 23 spline transfer case input and the other a 26 spline input. Both kits come with a modified 700R / 4L60 output shaft that must be installed into your transmission (2WD or 4WD). Both kits will require driveshaft modifications.

P/N 50-3701 - 700R / 4L60 to Toyota 23 spline chain-driven T/C

P/N 50-3703 - 700R / 4L60 to Toyota 26 spline chain-driven T/C

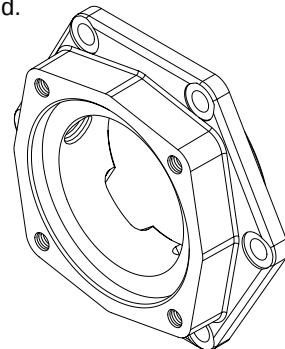


4L60E:

This transmission is identical to the 700R / 4L60 except that it is an electronically controlled transmission. GM manufactures this transmission in two versions. Both these transmissions use a reluctor ring connected to the GM engine computer for proper shifting points. The first version is a mirror image of the 700R, but it requires a reluctor ring. For this transmission, we utilize the same kits as listed for the 700R / 4L60; however a reluctor ring kit **P/N 716073** must be used.

The second version of the 4L60E is found mostly in 1997 & newer GM vehicles. The case and bellhousing on this version are no longer cast together (a removable bellhousing design). This transmission no longer has the square bolt pattern on the output side, but is equipped with a hex bolt pattern similar to a TH400. This transmission is 21-7/8" long and is used in both 2WD & 4WD vehicles. We manufacture an adapter plate that bolts to the output side of this transmission, giving it both the reluctor pickup and the same O.A.L. as the 700R. To use this transmission, you must purchase two kits. The first kit is a 700R / 4L60 that was previously mentioned.

This kit requires that a new output shaft be installed. The second kit takes the hex bolt pattern and converts it to a square bolt pattern, **P/N 50-0405**. This kit also includes a clamp-on reluctor and sensor.



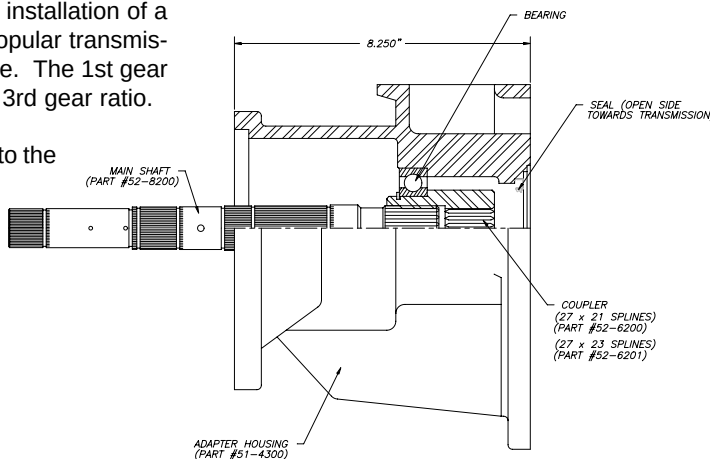
- P/N 50-5705** - 4L60E to Toyota 21 spline gear-driven T/C*
 - P/N 50-5706** - 4L60E to Toyota 23 spline gear-driven T/C*
 - P/N 50-3701** - 4L60E to Toyota 23 spline chain-driven T/C*
 - P/N 50-3703** - 4L60E to Toyota 26 spline chain-driven T/C*
 - P/N 50-0405** - 4L60E (removable bhsg.) additional adapter
- *For early 4L60E transmissions, a reluctor ring kit P/N716073 must be purchased.

C4:

This 3 speed transmission was used in Ford cars & trucks from 1964 to 1981. We recommend obtaining a 1970 & newer transmission for conversions. The transmission case length is 11.180", and with the bellhousing measures 17.00". This transmission was used up against small block Ford engines. The adapters we manufacture will normally require the installation of a new output shaft. This is the most popular transmission when converting to a Ford engine. The 1st gear ratio is 2.46:1; 2nd 1.46:1, and a 1:1 3rd gear ratio.

We only offer transfer case adapters to couple this transmission to the Toyota gear-driven transfer case, both 21 & 23 spline. These kits include a modified output shaft that must be installed into this transmission. The adapter has an O.A.L. of 8-1/4". When combined with the C4 transmission, the assembly length will be comparable to the 1984 to 1995 Toyota 4 cylinder 5 speed assembly length.

- P/N 50-4400** - C4 to Toyota 21 spline gear-driven T/C
- P/N 50-4401** - C4 to Toyota 23 spline gear-driven T/C

**AOD & AODE:**

The Ford AOD automatic overdrive 4 speed is drastically different in appearance than any of the C-series transmissions. This integral (one piece) transmission was introduced in 1980, and is found in the F-series pickups behind small blocks. The transfer case adapters we manufacture for this transmission require the installation of a new output shaft. The AOD was used up until 1993, in cars & trucks.

The 1980-87 (early) transmission main shaft was different than the 1988 & up (late) transmission main shaft. These shafts use different oiling holes and, if interchanged, could cause improper shifting or transmission damage. This transmission is becoming very popular for many conversions. We offer adapters for most early and late transmission applications. The transmission A.O.L. is 20.50" long. It has a 1st gear ratio of 2.40:1; 2nd 1.47:1; 3rd 1:1, and the 4th gear is a 33% overdrive.



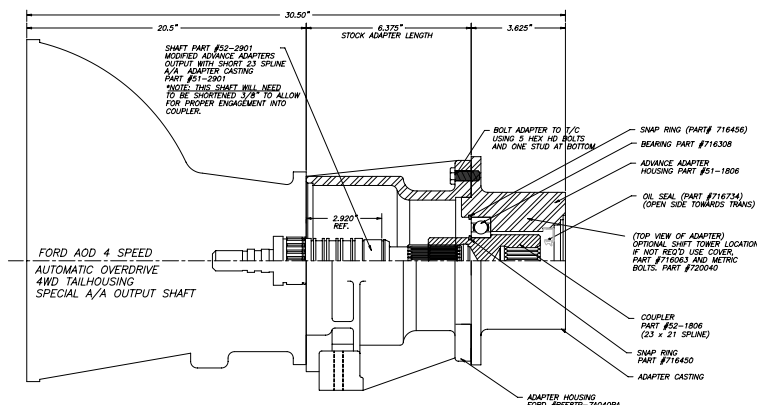
The Ford AODE is identical to the AOD, except that it is electronically controlled. The output shaft used in the AODE was also different with reference to the oiling holes. Since the AODE does not have a governor, the



oil supply line must be plugged. Our kit for the AOD can be used on the AODE transmission provided that you obtain kit P/N 716057. This shaft kit includes a plug pin, a sleeve to keep the pin in the shaft, and governor snap ring to retain the sleeve.

We only offer one transfer case adapter kit to adapt the AOD & AODE. This kit fits only the Toyota 21 spline gear-driven transfer case. A modified output shaft is supplied in this kit and must be installed into your transmission. Due to the overall length of this adapter & transmission, driveline modifications will be required on all vehicles.

P/N 50-4402 - AOD/AODE to Toyota 21 spline gear-driven T/C (88 & newer)

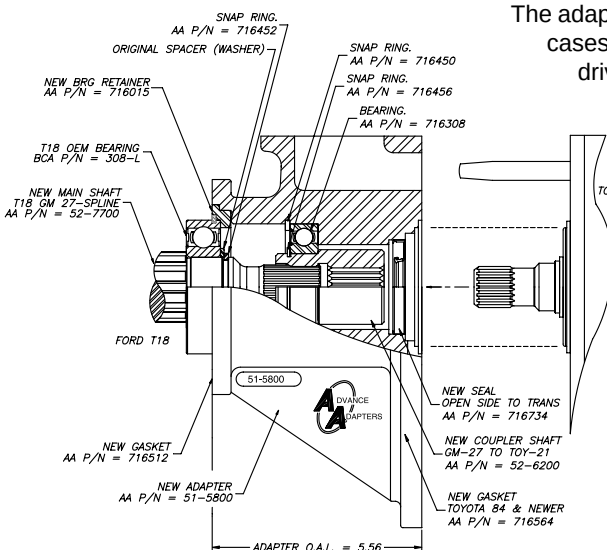


MANUAL TRANSMISSIONS:

The truck transmissions can also be easily adapted to the Toyota transfer cases. We offer adapters for the NV3550, the GM NV4500, and the Ford truck 4 speeds (T18 & NP435). These transmissions offer a super low 1st gear ratio which is excellent for offroad use when rocky terrain is involved. For normal everyday driving, the 1st gear is very seldom used. The disadvantages of these types of transmissions is the size & weight along with stiff shifting. Some of the transfer case adapters will require new main shafts, while other kits use a spud shaft that simply slips over the original output shaft.

FORD T18:

For the customer that really requires a rugged gear box, we offer an adapter kit that will enable the use of the Ford T18 truck 4 speed into the Toyota 4WD trucks. This transmission, found in 1965 to 1985 Ford pickups, is identified by a case length of 11.875". The 1st gear ratio is 6.32:1; 2nd 3.09:1; 3rd 1.69:1, and a 1:1 4th gear ratio. The adapters we manufacture for this transmission come with a new main shaft. Ford was not the only manufacturer who used the T18 transmission. When searching for a T18 in salvage yards, make sure the bellhousing bolt pattern has a dimension of approximately 8-1/2" across the top, and 6-1/4" top-to-bottom. The input shaft stickout should be approximately 6-1/2".



The adapters we offer will fit in both the 21 and 23 spline gear-driven Toyota transfer cases. Depending on which transmission you are replacing will determine the driveshaft and transfer case modification requirements. A minimum 2" body lift is mandatory on all vehicles using this transmission to allow for tunnel clearance. The transfer case adapter housing for this kit is 5-1/2" long. This transmission is designed to be used with a standard Ford small block engine or we also offer a conversion bellhousing to use the T18 with a Chevy small block engine.

P/N 50-5801 - Ford T18 to Toyota 21 spline gear-driven T/C

P/N 50-5802 - Ford T18 to Toyota 23 spline gear-driven T/C

If you are using a Chevy small block engine, we offer a conversion bellhousing that will couple to this Ford transmission along with the necessary clutch components.

P/N 712549 - Ford transmission to Chevy engine

P/N CF165552 - 11" Chevy pressure plate

P/N 281226 - 11" Ford clutch disc

P/N N1714 - Release bearing

P/N 716288 - Slave cylinder bracket

P/N 716119S - Toyota Land Cruiser slave cylinder (w/ stock push rod)

NP435 (Ford truck style):

We offer adapters for the Ford version of the NP435. These adapters do not work on the Chevy or Dodge NP435. This transmission has a case length of 10.875". The 1st gear ratio is 6.69:1; 2nd 3.34:1; 3rd 1.66:1, and a 1:1 4th gear ratio. This transmission was used in Ford pickups from 1969 to 1979. It is easily identified by an aluminum shift cover. This transmission is available with two front input shaft lengths. The 6-1/2" input shaft stickout length is the ideal version to look for.

We offer two adapters to use this transmission up to the Toyota gear-driven transfer cases. Both the 21 & 23 spline kits will require a new output shaft to be installed into your NP435 transmission. A minimum 2" body lift is mandatory on all vehicles using this transmission to allow for tunnel clearance. The adapter housing is 5-1/2" long. This transmission is designed to be used with a standard Ford small block engine; however, we do offer a bellhousing adapter to use it with a Chevy small block engine. Depending on what drivetrain is being replaced, driveshaft modifications may be necessary.

P/N 50-5804 - Ford NP435 to Toyota 21 spline gear-driven T/C

P/N 50-5803 - Ford NP435 to Toyota 23 spline gear-driven T/C

If you are using a Chevy small block engine, we offer a conversion bellhousing that will couple to this Ford transmission along with the necessary clutch components.

P/N 712549 - Ford transmission to Chevy engine

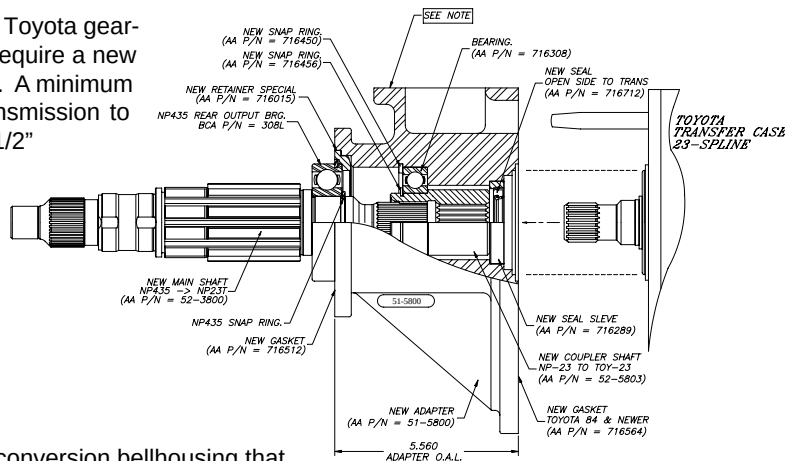
P/N CF165552 11" Chevy pressure plate

P/N 281226 - 11" Ford clutch disc

P/N N1714 - Release bearing

P/N 716288 - Slave cylinder bracket

P/N 716119S - Toyota Land Cruiser slave cylinder (w/ stock push rod)



GM NV4500 4WD (1996-2006): This transmission has the same gear ratio as the 1995 version. Chevy once again changed the bellhousing-to-transmission bolt pattern and went to a larger bellhousing index diameter. This Chevy NV4500 has the same bellhousing-to-transmission bolt pattern as the Dodge NV4500. These transmissions use a GM internal release bearing. The bearing retainer on this version was aluminum and did not have any type of snout to support a conventional release bearing.

The Toyota transfer case adapters that we manufacture for these transmissions are all identical. The kits we offer fit both the 21 & 23 spline gear-driven transfer cases. They require the removal of the stock GM adapter housing. Once the adapter housing is removed, you will either have a large harmonic balancer or a steel sleeve that must also be removed from the transmission. The harmonic balancer or steel sleeve covers the 31 spline portion of this 4WD GM transmission output shaft which we adapt to. When installing this transmission in a Toyota vehicle, a minimum 2" body lift is mandatory. Most of these applications will require driveshaft modifications. *All NV4500 transmissions have a case length of 12.375".*



We offer both conversion bell housings and adapter plates to couple these transmissions to a Chevy engine, Ford small block, and the stock Toyota 4 cylinder. We have listed the individual components necessary to accomplish each of these swaps. We also offer complete adapter packages (less the transmission).

P/N 50-0215 - GM NV4500 4WD to Toyota 21 spline gear-driven T/C

P/N 50-0216 - GM NV4500 4WD to Toyota 23 spline gear-driven T/C

If you are using a Chevy small block engine, we offer a conversion bellhousing that will allow you to use the GM NV4500 4WD transmission. We have also listed the necessary clutch components.

P/N 712576 - NV4500 4WD (1996-2006) to Chevy engine

P/N CF165552 11" Chevy pressure plate

P/N 383735 - 11" Chevy clutch disc

P/N N1430 - Release bearing

P/N 716288 - Slave cylinder bracket

P/N 716119S - Toyota Land Cruiser slave cylinder (w/ stock push rod)



P/N 712577

If you are using a Ford small block engine, we offer conversion adapters that will allow you to use the GM NV4500 4WD transmission. We recommend the use of a 1985 to 1988 F150 bellhousing to work with these adapter plates. **We do not offer any adapters to use the early GM NV4500 4WD (w/ the 6.34-to-1 gear ratio) to a Ford engine.**

P/N 712552 - NV4500 4WD (1995) to Ford engine (new Dodge input shaft included)

P/N 712551 - NV4500 4WD (1996-2006) to Ford engine (requires P/N 52-0219 & 716068)

NV3550 5 speed: The NV3550 transmission is a new optional transmission for swapping into the Toyotas. This 5 speed is rated at 300 ft./lbs. at 7200 GVW. The weight of this 5 speed is 97 lbs. The gearing of this 5 speed is as follows: 1st 4.01:1; 2nd 2.32:1; 3rd 1.40:1; 4th 1.00:1; 5th 0.78:1, and Reverse 3.57:1. This transmission is 16-3/4" long. When coupled to our 3.625" transfer case adapter and a 7-3/8" bellhousing, this transmission package has an O.A.L. of 27-3/4".

The NV3550 has a 7-3/8" long input shaft. We manufacture a Chevy bellhousing that bolts to the front of this transmission. The clutch disc spline on the NV3500 is 1-1/8" 10 spline. This bellhousing is set up to use the same clutch components found on **Page 13** of this manual except for the clutch disc which is P/N 383271.

P/N 50-1806A - NV3550 to Toyota 21 spl. gear-driven T/C

P/N 50-1807A - NV3550 to Toyota 23 spl. gear-driven T/C

P/N 712591 - NV3550 to Chevy V6 & V8

P/N 26-3550 - NV3550 transmission

Atlas Transfer Case into the Tacoma, Tundra & T100

We've had numerous requests for gear reductions for the later model Toyotas. Rather than designing a reduction adapter, we opted to do a transfer case swap. We designed an adapter that would bolt to the stock Toyota 5 speed or automatic transmission tailhousing and offer the installation of the trail-proven Atlas transfer case. The stock crossmember mount remains in the same location since it is located on this stock housing. The adapter plate orientates the Atlas in the same clocking rotation as the stock transfer case. The adapter plate and spud shaft basically make the rear of the stock Toyota transmission look just like that of a Jeep (circular 6 bolts and a 23 spline output). The six ratios we offer are a 2.0:1, 3.0:1, 3.8:1, 4.3:1 & 5.01:1. The only change to the Atlas transfer case is a longer shift rail for additional clearance on the stock tailhousing.

Toyota Tacoma 1995 & 1/2 to 2004

Application	4 cyl. 5sp man.	4 cyl. auto	3.4L V-6 5sp	3.4L V-6 auto
Stock T-case input spline	26	26	23	23
Atlas Adapter kit	50-5711	50-5711	50-5710	50-5710

Toyota Tundra 2000 to 2004

Application	3.4L 5sp	3.4L auto	4.7L I-force V-8 (auto only)
Stock T-case input spline	23	23	23
Atlas Adapter kit	50-5710	50-5710	50-5710

Tacoma, Tundra & T100 - Atlas swap information:

Adapter length	3/8"
Left drop Case	Stock is a left hand case drop (RH solid axle swaps are common)
Atlas Input Spline	23 (for both 50-5710 & 50-5711 kits)
Std case Rotations	LH: 3 to 46 degrees (40 degrees is stock); RH: 15 to 46 degrees
Atlas Tailhousing	ALT32
Yokes	High Angle Driveline can make a special Toyota flange yoke (Tel# 530-877-2875)
Shifters	Cable shifters recommended (std shifter comes through the floor near the dash)



Install Notes

No crossmember modifications needed. The stock mount and location are retained. Some floorboard modifications are needed. Driveshaft modifications are required and some grinding may be required on the Atlas tailhousing and shifter tower. There is also some wiring needed on later Tacoma models with VSS and/or push button shifting.

Speedo / VSS

1995-1997

Fully mechanical speedo. 300613 is a cable adapter that will adapt the standard Atlas speedometer drive to the stock cable.

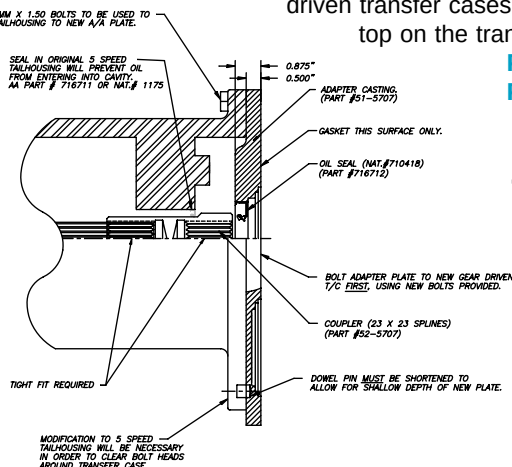
1998-2004

P/N 300605 is a VSS speedometer kit that retains your stock VSS sending unit from your transfer case and couples it to the standard Atlas speedometer drive (P/N 301506).



TOYOTA R150F TRANSMISSION TO TOYOTA 21 & 23 SPLINE GEAR DRIVEN TRANSFER CASE:

This adapter kit is compatible with both the 21 & 23 spline gear drive transfer case. This kit allows you to either couple one of the double transfer case crawler adapters or a set of Trail Tamer low gears to your Toyota and still retain your stock transmission. Gear-driven transfer cases used with this adapter must have the transfer case shifter mounted on the top on the transfer case.



P/N 50-5707 - Toyota R150F to 23 spline gear-driven T/C
P/N 50-5708 - Toyota R150F to 21 spline gear-driven T/C

TOYOTA R150F & R151F TRANSMISSION TO TOYOTA 4 CYLINDER BELLHOUSING ADAPTER:

This adapter plate allows you to fit either one of these transmissions to the stock 4 cylinder bell housings. The R150F & the R151F were coupled to the Toyota V6 and the Turbo charged 4 cylinder. These transmission were built to handle more torque and horsepower than the stock 4 cylinders transmission. This adapter plate is 5/8" thick and come with a crank spacer to retain input shaft support.

P/N 712562 - Toyota R150F/R151F to 4 cylinder bellhousing

ADVANCE CRAWLING SYSTEMS

Tx2 Crawler Adapters:

Because of larger tires with a stock drivetrain, most Toyota trucks are not geared low enough. A double transfer case crawler adapter can be an easy solution to your gearing problems. Low gearing allows you control crawl over obstacles; and keeping the vehicle under control saves on wear & tear and, in many cases, less breakages.

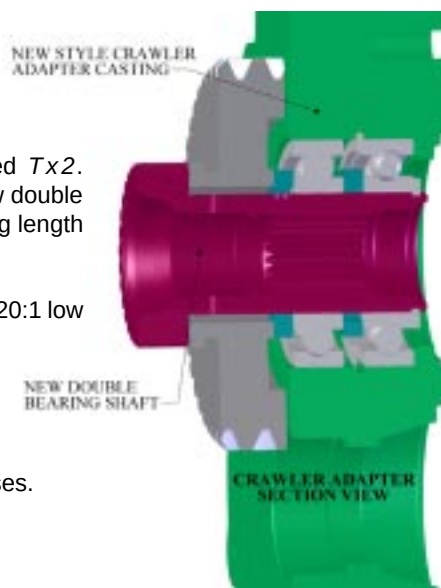
We are pleased to release as part of our *Advance Crawling Systems* our all new redesigned Tx2. Designed for 1979-95 Toyota truck gear-driven transfer cases (21 or 23 spline), this new double bearing design is ideal to help with gear support and deflection. Tx2 kits have a casting length of only 2.375" long.

This gear box takes the stock Toyota transfer case from a low gear ratio of 2.28:1, to a 5.20:1 low gear ratio. The stock gear-driven Toyota transfer case is assembled from the factory in 3 basic portions. By using the front section of the transfer case as a donor box, our adapter will allow you to install this reduction box between your transmission and transfer case. When installing this unit, driveline and floorboard modifications are required. Since the stock transfer case is also being relocated further back, an extended speedometer cable will be necessary. The kits we offer fit both the 21 & 23 spline gear-driven transfer cases.

P/N 50-5905D - Tx2 Crawler Adapter for 21 spline gear-driven T/C

P/N 50-5906D - Tx2 Crawler Adapter for 23 spline gear-driven T/C

P/N 716186-C - Speedometer cable extension



The 1979-83 Carbureted and the 1985-88 EFI T/Cs have the shifter on the transfer case with a 4 bolt cast iron base of 3-1/8" x 4-3/8". When using one of these cases as a donor box, your shifters would measure 6-1/2" apart.

1984-88 Carbureted and 1986-87 EFI Turbo T/Cs have the T/C shifter located on the transmission tailhousing with a 4 bolt aluminum base of 3-1/4" x 4". When using one of these cases as a donor box, your shifters would measure 11" apart.

The 1989-95 EFI T/C shifter is located on the transmission tailhousing. This transfer case has a 6 bolt aluminum base that houses both the transfer case & transmission shift handles. This aluminum base is 4" x 8". When using one of these cases as a donor box, your shifter's would measure 10" apart.

Note #1 - The rear T/case must be a top shifting style (1979-83 Carbureted or 1985-88 EFI).

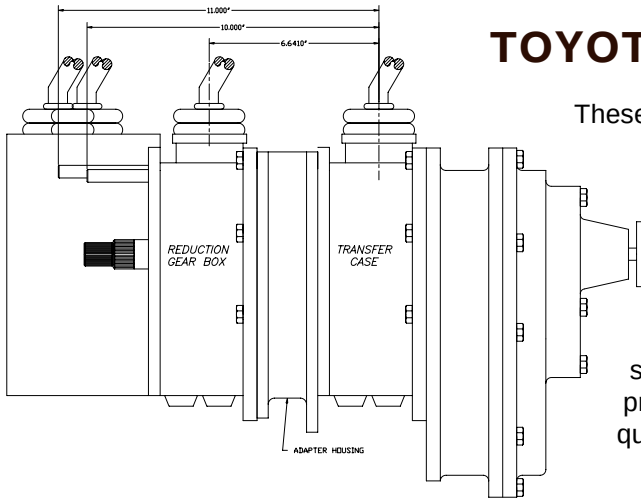
Note #2 - The reduction gear box can retain the original T/C shift rod location to match to the existing transmission, or the reduction box can be changed out to the 1979-83 carbureted or 1985-88 EFI box (T/C shift lever on reduction box).

Note #3 - Shift rods, forks & driveshaft flanges are interchangeable between all years shown.

Heavy-Duty Toyota Transfer Case Front Housing:

On the 4.77 & 5.0 gears, the stock case must be machined or ground to provide clearance for the cluster gear. On some 4.0 cluster gears, we have found that the case will need to be relieved due to core shift. You can grind the necessary clearance; however, it is recommended to machine the case for this clearance.

If your not sure about this grinding or the machining process, we now offer a new heavy duty front Toyota housing. Our new Toyota HD housing can be used as a crawler box with stock Toyota gears or with our low gear sets. It can also be used as a new front housing for the lower gear sets listed above. This housing will save you time and money. When installing our low gears into a stock Toyota housing, grinding & machining on the stock case is required. Our housing has been engineered with additional clearance for our gear sets. Thus, hours of grinding & expensive machining labor are eliminated. This housing is made from 356-T6 heat-treated aluminum alloy with an average thickness of .550". A "stock" housing is die cast aluminum and only has an average wall thickness of .200". **P/N 51-5911**



TOYOTA TRANSFER CASE LOW GEARS:

These Toyota Truck gears are a direct replacement for your stock gear-driven Toyota transfer case gears. There are no driveline modifications required. Average installation time between 6-8 hours. The kit includes the gear set, bearings, seals and gaskets. We also offer complete rebuild kits for your Toyota truck transfer case.

Our rock crawler gear sets offer the 4.7:1 low range. All gear sets will require some internal grinding on the Toyota case for proper clearance and fit. The Toyota shift fork boss will also require some grinding for the low gear clearance.

TOYOTA LOW GEAR SETS:

- Part No. 477021** - 21 tooth 4.7:1 GEAR SET
Part No. 477023 - 23 tooth 4.7:1 GEAR SET

Part No. 400107 - Full Transfer Case Rebuild kit (needle bearings not included)

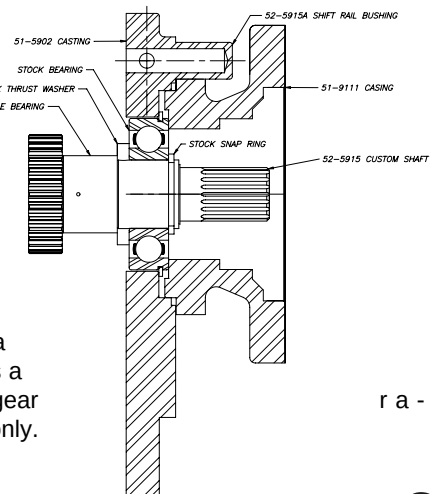
If your truck differential ratio is:	stock 2.28 gears final drive ratio is:	has 4.7 Low Gears, final drive ratio will be:
4.10 to 1	37 to 1	77 to 1
4.88 to 1	44 to 1	91 to 1
5.29 to 1	47 to 1	99 to 1
5.71 to 1	51 to 1	107 to 1

Stock transmission first gear ratio x stock transfer case low range ratio x differential ratio.

Stock transmission first gear ratio x stock transfer case low range ratio x differential ratio.

TOYOTA CRAWLER BOX TO A JEEP DANA 300 TRANSFER CASE:

This kit allows you to couple the reduction portion of the Toyota transfer case to a Dana 300 transfer case. This adapter is a two housing kit, one to support the gears in the Toyota reduction box and the second to bolt to the Dana 300 transfer case. The kit also includes a new 23 spline shaft to engage the Dana 300 input gear. The Dana 300 offers a 2.62:1 low gear ratio and allows some shifting options like low gear rear axle only and low gear front axle only.



r a -

P/N 50-5915 - Toyota reduction/crawler box to a Jeep Dana 300 transfer case.



TOYOTA CONVERSIONS “STEP BY STEP” GUIDE

The following step-by-step procedures are to be used as a guide only in performing your Toyota 4WD engine and transmission conversion. There are several variations and exceptions to these procedures. We recommend that you refer to your Toyota Service Manual for specific electrical, torque, and gasket specifications. If you are in doubt on any of the information listed on the following pages, please contact our technical department. In addition to this manual, you will have individual instruction sheets on the engine motor mounts and transfer case-to-transmission adapter kits. We recommend that you carefully read both sets of instructions while performing your conversion.

REMOVING THE ENGINE & TRANSMISSION:

1. Remove the front and rear drivelines.
2. Disconnect the speedometer cable from transfer case.
3. Disconnect the throttle linkage from the engine.
4. Drain and remove the radiator assembly.
5. Disconnect the alternator and battery.
6. Disconnect the temperature and oil pressure sending units. **Identify these wires for future use.**
7. Remove the hood and complete exhaust system.
8. Disconnect the clutch slave cylinder and hydraulic line.
9. Remove the transmission shift lever.
10. Remove the transfer case shift lever.
11. On the stock coil, you will find a yellow wire that connects to the positive terminal. Disconnect this wire and mark it for future use with the new engine. Remove the coil and igniter.
12. Disconnect the power steering pump hoses from the engine.
13. Disconnect the air conditioning compressor lines.
14. Check the engine and transmission for any items that have not been disconnected.
15. Attach an engine hoist to the engine assembly.
16. Place a small jack or transmission floor jack directly beneath the transfer case and transmission. With the jack in position, you can now remove the four transfer case mounting bolts and disconnect the transfer case crossmember.
17. Disconnect the bellhousing from the back of the block, as the engine and transmission assembly must be removed separately.
18. Remove the engine mount nuts that hold the engine mounting rubber to the engine perch.
19. Remove the engine from the engine compartment.
- NOTE: When removing engine, make sure the transmission and transfer case are properly supported.**
20. Remove the transmission and transfer case.

ENGINE PREPARATION:

1. Depending on which engine is being used, it is best to install all of the brackets, pulleys, and accessories prior to assembly into the vehicle. This will be the installer's option if he desires to assemble these parts after the engine has been positioned into the vehicle.
2. The temperature sending unit from the original Toyota engine can now be installed into the new engine block.
3. The oil pressure switch from the original engine must be used with the new engine if the original dash gauge is going to be retained.
4. The power steering pump, air conditioning bracket, and alternator bracket can now be fastened to the engine - depending on the vehicle requirements. Refer to the Engine Conversion section for the recommended bracketry and alternate solutions.
5. The engine mounts can now be bolted onto the engine, depending on which engine and which type of suspension your vehicle will be equipped with. Refer to the motor mount instruction sheets for these requirements.

INSTALLING A MANUAL 5 SPEED TRANSMISSION:

1. With your new engine prepared, you must first bolt the correct flywheel onto the engine crank. Make sure the proper torque specifications are used.
2. Install new pilot bearing into the engine crank shaft.
3. The Centerforce pressure plate and clutch disc can now be bolted to the flywheel. Be sure to align the clutch disc and pilot input shaft before securing the pressure plate.
4. The 5 speed bellhousing will bolt to the transmission from the inside of the bellhousing. Use the original bolts with the new bellhousing. Install the release lever & release lever ball pivot.
5. Mount the slave cylinder onto the bellhousing and make sure the alignment of the push rod & release lever are properly located.
6. Install release bearing **P/N N1430** over the Toyota transmission bearing retainer. On the inside of the release bearing, you will find a small groove that must be packed with grease. This will provide lubrication between the bearing and the bearing collar.

7. With the bellhousing, transmission, and throw out bearing assembled, you can now bolt the bellhousing to the new engine. Make sure that the dowel pins align the engine block and the bellhousing. **DO NOT FORCE** the assembly together. The input shaft of the transmission must fit smoothly into the new pilot bearing and engine crank. The tip of the input shaft must engage the pilot bearing with a minimum of 1/2" contact. With the bellhousing in position, the release bearing should have approximately 1/16" clearance between the clutch fingers. You may need to adjust the length of the slave cylinder push rod in order to obtain the proper clearance between the release bearing and clutch fingers. A return spring on the clutch fork is recommended whenever possible. The original Toyota slave cylinder fitting will screw directly into the Land Cruiser slave cylinder assembly. After securing all of the fittings, you will need to bleed the slave cylinder. Refer to your Toyota Service Manual for bleeding instructions.



ENGINE & TRANSMISSION INSTALLATION:

Most conversions will require the drivetrain to be installed into the vehicle in two parts. The transmission & transfer case should be set back up on the crossmember and into the vehicle. By using an engine hoist, lower the new engine into your engine compartment. Before securing the motor mounts or crossmember, bolt the transmission to the engine.

1. Check to make sure that all components have the necessary clearance. On vehicles equipped with the I.F.S. suspension, you will be required to use a suspension lift in order to have sufficient oil pan clearance. (Refer to the subheadings "Body & Suspension Lift" under the Engine Conversion section for more information).
2. Position the engine mounts for either welding or bolting into position.
3. Make the necessary modifications for the transfer case support. Chevy V8 to 5 speed installations will require the crossmember mounting holes to be elongated approximately 3/8".
4. On V8 conversions using HEI distributors, you may be required to modify the firewall for clearance of the distributor cap.
5. Install front and rear drivelines.
6. Install the speedometer cable & transfer case indicator switch.
7. Install the throttle cable linkage. This may vary depending on which type of manifold and carburetor that is being used.
8. The radiator can now be positioned into the original mounting brackets. The radiator can either be the A/A 4-core copper/brass radiator (vehicles 1985 & up) or our Rad-A-Cool aluminum single core radiator (for 1979-95 vehicles). These radiators have the trans coolers built into the radiator system. We recommend a 1-1/2" hose connection for both the inlet and outlet, and we have found it best to use the universal flex hoses for most installations.
9. Connect the starter wires, alternator wires, and battery terminal. Make sure that your engine is equipped with a ground wire.
10. The vacuum connections for both the automatic transmission and brake booster must be reinstalled onto the new engine. Available at most part stores are multi-fitted vacuum hose connectors. These will provide for several vacuum hose connections onto your new manifold.
11. Install your new exhaust manifolds. The manifolds can be either the stock cast iron type, or our "SlickFit" headers.
12. The transmission and transfer case shift levers can now be reinstalled. If an automatic transmission is being used, you will need to purchase a floor console type shifter from various suppliers. Both Hurst and B & M offer excellent automatic transmission shifter kits.
13. You will not be able to use the original 4 cylinder coil and igniter, since they will not be compatible with your new engine. The original yellow wire that was attached to the stock coil will be your main feed line to the new ignition system. Depending on your distributor selection will determine your need for an external resistor. On Mallory dual point installations, an external resistor will be required.

AUTOMATIC TRANSMISSIONS TO ENGINE ASSEMBLY:

1. Install the correct flywheel (flexplate) onto the engine crank using the special flywheel bolts torqued to the proper specification.
2. Install the torque converter onto the transmission pump. Make sure both sets of torque converter female splines are engaged into the input shaft male splines. **CAUTION:** There are two sets of splines and it is *very critical* that the converter seats into both sets.
3. The transmission can now be assembled to the engine block. Make sure the dowel pins align the transmission case and engine block.
4. With the transmission and engine now assembled, you must install the bolts between the torque converter and flywheel. The torque converter should require approximately 1/8" movement from the seated position outward to meet the flywheel. If this movement outward is not obtained and the converter is jamming the flywheel, you will probably find that the convertor was not installed properly.
5. Install the stock inspection cover.
6. The small flanges on each side of the transmission will need to be trimmed for the exhaust system clearances. This trimming will also need to be done on both the inspection cover and transmission case.



CONVERSION APPLICATION SUMMARY

This section summarizes some of the most common conversions that we deal with. Please refer to the Engine, Transfer Case, and Transmission Conversion sections for more complete conversion considerations. The information is comprised from 20 years of Toyota conversion experiences, along with the valuable input we received from our customers. If you find any of this information outdated or incorrect, please let us know. The information you provide may be useful in assisting others in the future.

1979-85 TOYOTA 4WD - CHEVY 4.3 V6 to AUTOMATIC TRANSMISSION:

For these year series Toyota trucks equipped with the solid front axle and 4 cylinder engine, the Chevy 4.3 V6 makes an excellent engine choice. This engine can be adapted up to your Toyota transfer case with either the TH350 or 700R-4 automatic transmission. On vehicles 1984-85, equipped with a 5 speed transmission, you can retain the original 5 speed.

A. *Motor Mounts:* The engine mounts for the Chevy 4.3 V6 (P/N 713001-S) are fully adjustable and can be positioned to the inside of the Toyota frame rails. The mounts can either be welded or bolted into their final position. Things to still take into consideration are height of engine, distributor, and radiator clearance. Slight firewall modifications may be required.

B. *Radiator:* The stock radiator is not normally sufficient to cool the newer V6 engine. For the Chevy V6 applications, Part No. 716681, 716698-AA or 716698-AB is recommended. If the 716681 radiator is used on vehicles 1984 & earlier, the front crossmember/core support will need to be modified.

C. *Exhaust:* There is ample room to use late model stock manifolds if emission equipment is being retained. We offer exhaust headers, but you may have interference problems with the release arm when retaining your stock transmission.



Adjustable crossmember mount
P/N 713125-C

D. *Transmission Crossmember:* The stock 5 speed transmission has an overall length of either 19" or 22-1/2" long. When replacing this transmission with a TH350 or 700R, the overall assembly length will be longer. This added length will normally require you to relocate your transfer case. We offer P/N 713125-C that will allow the transfer case to be relocated up to 6" rearward without modifying your crossmember.

E. *Driveshafts:* If you are converting an early style vehicle, you will find it necessary to modify your drivelines and relocate your transfer case accordingly. The 1984-85 vehicles have the longer 5 speed transmission than the earlier model 1979-83. These models should be able to interchange the new automatic or retain the manual transmission without driveline modifications. This will depend on your specific application and engine location.



Radiator-to-fan clearance

F. *Gauges:* The gauges were converted using the V6 sending units. These sending units are compatible with the Toyota gauges. The original tachometer will need to be re-calibrated or replaced. Both the oil pressure and engine temperature or sensors from the Toyota have a metric thread. Special bushings will need to be installed into the manifolds for these metric thread fittings.

1984-85 TOYOTA 4WD - CHEVY 4.3 V6 to 700R-4 AUTOMATIC:

This section details a V6 conversion on a 1985 Toyota SR5 extra cab 4WD truck. The truck was originally equipped with a multi-point, fuel injected 2.4 4 cylinder engine and a 5 speed transmission that is 25-3/8" long. The new engine is a 1988 Chevy 4.3 throttle body injected V6 engine. The transmission is a late model GM 700R 4 speed automatic built with a manual 3rd and 4th gear lockup.

A. *Motor Mounts:* The engine was positioned by using our engine mounts that were welded into the frame rails. The engine mounts for the Chevy V6 (P/N 713001-S) are fully adjustable and can be positioned to the inside of the Toyota frame rails. The mounts can either be welded or bolted into their final position. Things to still take into consideration are height of engine, distributor, and radiator clearance. Slight firewall modifications are required.

B. *Suspension & Body Lift:* These particular vehicles have all been equipped with a solid front axle. A suspension lift will aid in the installation of a V6, providing additional front driveshaft clearance. A minimum of a 2" body lift is required to provide the necessary engine & transmission tunnel clearances.

C. *Radiator:* The cooling system consisted of our 4-core copper/brass V6 radiator, P/N 716681, that was used in the stock location. The radiator hung low enough that it required a steel guard for maximum road protection. The guard was manufactured from a piece of 3" angle iron. A universal flex hose was used for the upper hose, and a universal flex hose with reinforcement spring

was used for the lower hose. The original Toyota radiator cap and overflow setup was reused on the new radiator. A 17" reversed direction flex fan was used inside a Chevy Camaro fan shroud. In a typical GM application, hot water for the heater core is taken from a tube located on the passenger side of the engine. Once the water circulates through the heater core, it is replaced in the system via a tube connection at the radiator. For this installation, water for the heater core was taken from the water outlet on the intake manifold. Water from the heater core was returned to the cooling system via the tube on the rear of the engine. A 190 degree thermostat was installed.



D. Exhaust: There is ample room to use late model stock manifolds if emission equipment is being retained.



4.3 V6 header clearance
on a Toyota 4WD

E. Transfer Case Adapter: The GM 700R-4 transmission is a 4 speed automatic overdrive transmission. Make sure that, when selecting the transmission, you obtain one that will be compatible with your new engine. This transmission is only available for Chevy engines. The kit that we supply for using this transmission with the Toyota transfer case is **P/N 50-5705**. This adapter will bolt directly to the back of the transmission and couple onto the new output shaft.

F. Transmission Crossmember: When replacing the stock 5 speed with a TH350, the new overall length is approximately 25" long. The crossmember was left in the original location and a custom crossmember extension was fabricated to extend the mounting pad off the original crossmember. The floorboard of the truck had to be modified to accept the new transfer case shifter location. A B & M Shifter was used for the transmission control. A neutral safety switch was wired between the B & M shifter and the starter solenoid.

G. Driveshafts: When installing the 700R-4, you will need to perform driveshaft modifications for most installations. The overall length of this transmission with the adapter installed will be approximately 26-3/4" long. On this particular conversion the two driveshafts had to be modified approximately 1-1/2".

H. Fuel System: The fuel system that was originally installed for the Toyota 4 cylinder engine was located in the gas tank and disconnected for this installation. A second in-line fuel pump was installed slightly ahead of the gas tank. The electric power for the new fuel pump was supplied via the engine harness.

I. Alternator: The GM alternator (internally regulated) that came with the new engine was used and spliced into part of the original Toyota wiring. A new 8 gauge wire was installed from the B+ terminal of the alternator directly to the positive battery post. The case of the alternator was grounded using the original black Toyota wire. Terminals 1 & 2 on the alternator were tied to the white (+) and yellow (charge) wires in the Toyota harness.

J. Power Steering: The GM power steering pump that came with the new engine was used along with the original Toyota power steering box. The GM high pressure hose was reused by shortening the steel end at the steering box, replacing the tubing flared nut with one from the original Toyota hose and re-flaring the end of the tubing. The low pressure hoses were all simply hose clamped, and the original grille mounted fluid cooler was retained.

K. Electrical: A wiring harness from Howell Engine Development was used to connect all the GM engine sensors, computer, and truck wiring together. The computer box was mounted to the inside cab floor on the passenger side of the truck. The fuse block for the wiring harness was mounted behind the passenger side kick panel. The original Toyota V+ battery cable was connected to the starter on the new engine. The ignition switched solenoid line on the truck is current limited and cannot maintain sufficient voltage to engage the GM starter solenoid. It was necessary to tie this solenoid line to a relay and provide a switched V+ line directly from the battery. Voltage was supplied to the GM coil via the original Toyota harness wire. The new coil was also spliced onto the original tachometer line and worked fine, except the gauge now reads 1.5 times the actual engine RPM. The check engine light from the new engine harness was spliced into the original Toyota harness and works with the original in-dash light.

L. Throttle Linkage: The original Toyota throttle cable was used, and a custom attachment was made to mate the cable to the TBI unit. It was possible to retain the function of the original cruise control because the vacuum control unit ties into the throttle cable at a point inside the cab. Also, speed sensing is done at the speedometer cable which remained unchanged.

M. Air Conditioning: The GM compressor that the new engine was originally equipped with was used along with all the original Toyota air conditioning hardware. The Toyota and GM hose ends were mated using various tube fittings and crimp connections. A GM compressor electrical connection was spliced onto the Toyota AC electrical line.

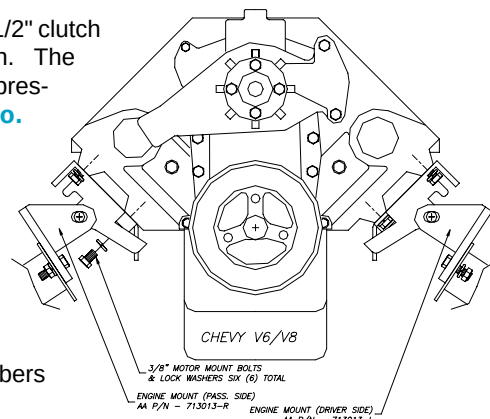
N. Gauges: The original Toyota temperature sender was threaded into the passenger side head of the V6 allowing the stock gauge to monitor the temperature. The original Toyota oil pressure sender was added to the V6 using a Stewart Warner adapter fitting. The stock gauge is used to monitor oil pressure. An aftermarket vacuum gauge was connected to one of the intake vacuum lines of the new 4.3 TBI engine. The stock voltage gauge was retained unchanged.

1986-95 TOYOTA 4WD (I.F.S.) - CHEVY V6 & V8/BUICK V6 using the stock 5-speed:

On Toyota conversions that are equipped with the I.F.S. suspension, you will have considerably more conversion expenses than the earlier model solid front axle vehicles. The following information covers Chevy V6, Buick V6, and Chevy V8 conversions retaining the stock Toyota 5-speed transmission.

A. **Clutch Assembly:** When using the new bellhousing, We recommend a 10-1/2" clutch assembly. The Chevy flywheel is a 153 teeth, and the Buick flywheel 160 teeth. The recommended clutch assembly would consist of a high diaphragm Centerforce pressure plate, **P/N CF360056**, and a custom made 10-1/2" clutch disc, **Part No. 716105**, that has a 1-1/8"-21 spline shaft size. The release bearing is the short Chevy design, **Part No. N1430**.

B. **Motor Mounts:** Due to the I.F.S. front axle and the torsion arms located on the inside of each frame rail, we were obligated to manufacture an engine mount that would directly bolt onto the original Toyota frame perch. We offer motor mounts that have been multi-drilled for various installations on I.F.S. vehicles. The mounts must be used in conjunction with the original Chevy block rubbers. The rubbers are not included with the our motor mount kit. You can order these GM rubbers under our **P/N 4980**, (GM Part No. 3990914 or Napa No. 6021106).



C. **Engine Location:** Since these vehicles are equipped with an independent front suspension (I.F.S.), the engine location cannot be varied. Things to still take into consideration are height of engine, distributor, and radiator clearance. Slight firewall modifications may be required.



Using the stock 5 speed with bellhousing P/N 712561

D. **Suspension & Body Lift:** When doing engine conversions on vehicles equipped with the I.F.S. suspension, your vehicle must be equipped with a 3" minimum suspension lift. We highly encourage all installations to use a suspension lift. **The modifications that are required when not using a suspension lift are considered major.** The design of the I.F.S. front axle does not permit clearances around the 4.3 V6 or V8 oil pans. For customers wanting to keep their truck at the stock height, special modified oil pans for V6 & V8 installations are available. **A minimum of a 2" body lift is required to provide the necessary engine & transmission tunnel clearances.**



E. **Driveshafts:** On V6 & V8 engine conversions retaining the stock transmissions, the driveshafts modifications may still be required depending your specific application and engine location.

1986-95 TOYOTA 4WD (I.F.S.) - FORD 289/302 V8:

Ford V8 installations into Toyota trucks are becoming more and more popular. The Ford engine is narrower than the Chevy V8; and this provides a better exhaust system clearance on engine conversions.

A. **Suspension & Body Lift:** Unlike the Chevy engines, where a suspension lift is mandatory in order to eliminate oil pan modifications, a Ford installation only requires minor modifications. A suspension lift is not required, but **a minimum 2" body lift is still recommended.**

B. **Oil Pan:** On Ford engine applications, we do not offer a modified oil pan, but the Mustang dual-sump pan will fit well with only minor modifications. You will need to provide a cutout in the front portion of the rear sump. With this modified oil pan, the installation will not require a suspension lift.

C. **Exhaust:** The exhaust system can either be early Maverick style manifolds or our SlickFit headers.

D. **Transmission Crossmember:** The length of our transfer case adapters are designed so that the engine can be positioned without relocating the transfer case. For example, a C4 assembled to the adapter housing will be relatively the same overall length as the stock 5 speed transmission that you are replacing.





Passenger side Ford header



Driver's side Ford header

Throttle linkage clearance
on a Ford valve cover



1988 & Up TOYOTA 4WD (I.F.S.) replacing a V6:

This section covers conversions when retaining the stock 5 speed or upgrading to an automatic transmission.

A. Bellhousing Adapter: The original transmission can be reused with our bellhousing, **P/N 712561**. When retaining the stock 5 speed, driveline modifications are required for both the V6 & V8 installations.

B. Transfer Case Adapter: Toyotas originally equipped with a V6 used a chain-driven transfer case. The adapters that we offer for the TH350 or 700R will require the relocation of the transfer case rearward, as well as floorboard modifications for the shifter handle.



Shifters in stock location

Floorboard modification
proper clearance

C. Motor Mounts: Due to the I.F.S. front axle and the torsion arms located on the inside of each frame rail, we were obligated to manufacture an engine mount that would directly bolt onto the original Toyota frame perch. Motor mounts, **P/N 713125** for Chevy V8s, and **P/N 713126** for Chevy V6s provide the proper engine height and location. The motor mounts come complete with new Chevy block mounts. Both mounting systems also include a crossmember relocation bracket.

D. Suspension & Body Lift: When doing engine conversions on vehicles equipped with the I.F.S. suspension, your vehicle must be equipped with a 3" minimum suspension lift. We highly encourage all installations to use a suspension lift. **The modifications that are required when not using a suspension lift are considered major.** The design of the I.F.S. front axle does not permit clearances around the V8 oil pans. For customers wanting to keep their truck at the stock height, special modified oil pans for V8 installations are available. **A minimum of a 2" body lift is required (3" is recommended) to provide the necessary engine & transmission tunnel clearances.**

E. Radiator: The stock radiator can be retained for use with a V6 engine; however, you will be required to reverse the inlet and outlet locations. The stock radiator is not normally sufficient to cool a V8 engine. When installing a larger engine, thought should be put into proper cooling. For Chevy V8 applications, the **Rad-A-Cool** single core aluminum radiator **P/N 716698-AA** or **P/N 716698-AB** is recommended. The engine location on these vehicles do not allow a lot of clearance for the radiator. This aluminum single core is the thinnest radiator we offer and allows ample cooling for most installations.

F. Exhaust: There is ample room to use late model stock manifolds if emission equipment is being retained. We offer two styles of header systems: manifold & tubular. Both types of headers will have interference problems with the release arm when retaining your stock transmission.



Transfer case support



Oil pan-to-I.F.S. clearance

SWAP LAWS

At the printing of this manual, these were some of the current requirements when performing a smog legal engine swap. Please check with your State Bureau of Automotive Repair, the Environmental Protection Agency, or Department of Motor Vehicles before starting your conversion. This information is to help assist you. Advance Adapters cannot be held responsible for any changes that occur in these laws and/or that are not listed.

Swapping a V8 (or V6) engine into a compact truck is a great way to gain performance and put a lot of fun into everyday driving. However, you may not be driving your V8-powered truck at all if you can't pass the government's smog inspection. Fortunately, the toughest smog laws in the nation (California's) are straightforward and fairly easy to follow. The following ([provided Joel Mollis of Sport Truck Magazine](#)) is a synopsis of California's regulations regarding engine swaps:

1. The engine to be installed must be the same model year (or newer) as the vehicle it's being installed in. For example, a '92 engine can be installed into an '89 truck, but not into a '94 truck.
2. A car engine can be installed in a truck.
3. All engines (for any year) must have their emissions controls in place and functional.
4. A federally certified (49-state) engine cannot be installed into a California-certified vehicle.
5. No internal or external performance parts may be used on any engine unless they are EPA-certified or Air Resource Board-exempted.
6. All vehicles must pass a visual, functional, and tailpipe-emissions test.

Of course there's more to getting a V8 swap approved than those six rules, but it's not as difficult as it used to be. For the most *complete* information contact your state's Bureau of Automotive Repair, the Environmental Protection Agency, or the Department of Motor Vehicles for guidance and regulations regarding legal engine swaps.

Provided courtesy of Sport Truck Magazine - PRIMEDIA



TOYOTA TRAIL TAMER ASSEMBLY & DISASSEMBLY PROCEDURES

The Advance Adapters Trail Tamer gears are ideal for the avid Toyota Truck rock crawler. These gears are designed for the Toyota Truck gear-driven transfer case. Depending on the model of your transfer case, some additional modifications may be required. Please refer to the Transfer Case information section for proper transfer case identification and possible modifications.

The installation of the Toyota Trail Tamer gear sets requires you to almost completely disassemble the transfer case. We have provided illustrative disassembly and assembly instructions to assist you. These instructions are to be used as a guide. The official Toyota shop manual is strongly recommended for additional information. If your transfer case is in need of a rebuild, now would be the time to do it.

DISASSEMBLY



(Step D-1)

- (1) *The transfer case must be in 2WD High before starting the disassembly procedures.* Remove the nut with a 30mm socket and then remove the flange.



(Step D-2)

- (2) Remove the 7 bolts that retain the rear extension housing with a 14mm metric socket. *HINT:* Keep these bolts in a separate container. This will reduce the chances of placing the bolts in the wrong location on reassembly.

(Step D-3)

- (3) With the rear extension housing removed, you will see the oil pump and speedometer drive gears. Slide the gears off of the rear output shaft. Take note of the orientation of the oil pump and the speedometer gear. *NOTE:* There is a small ball bearing under the speedometer drive gear. Make sure you store it in a bag or some other kind of container. These little parts can walk away.



(Step D-4)

- (4) Remove the rear output shaft bearing.



(Step D-5)

- (5) Remove outer bearing C-clip by reaching inside case and pushing up on gear, while lightly tapping on the case with a plastic soft blow mallet.



(Step D-6)

- (6) Remove the 10 bolts retaining the rear case cover with a 14mm socket. Retain these separately to avoid any confusion during assembly. *Some bolts are different lengths. Note their location before removal!*



(Step D-7)

- (7) Pull case off. Remove the two lubrication tubes located on either side of the main shaft. *Note their orientation!*



(Step D-8)

- (8) Using a 3/16" (4mm) punch, drive the roll pin out that holds the front wheel drive shift fork.



(Step D-9)

- (9) Slide the fork and clutch sleeve off the shift rail.



(Step D-10)

- (10) Remove the front wheel drive gear and its caged needle roller bearing assembly.



(Step D-11)

- (11) Remove the thick spacer found behind the front wheel drive gear and be aware of the small ball bearing underneath it.



(Step D-12)

- (12) Use a 12mm socket to remove the four bolts that retain the shift fork cover. With a 5mm Allen wrench, remove the shift detent screw plugs found on both sides of the case.



(Step D-13)

- (13) With the screw plugs removed, the shift ball and spring assemblies can be removed from both sides.

(Step D-14)

- (14) Drive the roll pin out that retains the high/low shift fork using a 3/16" (4mm) punch. Occasionally the pin will fall into the case. Don't worry. You will be able to retrieve the pin later. On 1979-83 and 1985-88 fuel injected model transfer cases, **DO NOT REMOVE** roll pin.





(Step D-15)

(15) Remove the shift rails, being careful not to lose the interlock pin that might fall out.

This interlock pin is located between the two shift rail detent assembly chambers.



(Step D-16)

(16) Remove the 4WD indicator switch with a 22mm wrench.

(Step D-17)

(17) Remove the interlock pin from the shifter detent chamber, if you haven't already done so in Step #D-15.



(Step D-18)

(18) Use a 14mm socket to remove the 4 bolts that retain the front case to the reduction case. Split the cases. Now you can retrieve the roll pin that might have fallen in as noted on Step #D-14.



(Step D-19)

(19) Remove the high/low shift fork with the clutch sleeve and needle bearing from the input shaft.



(Step D-20)

(20) Here are the gears that you will be replacing with the new Trail Tamer set.



(Step D-21)

(21) Remove the output shaft from the front case by removing the 4 bolts with a 12mm socket. Remove the bearing retainer and snap ring.



(Step D-22)

(22) Remove the snap rings that retain the input shaft and cluster gear bearings and remove the two from the case. You might have to use a slight tap from a soft plastic hammer to help them fall out.



(Step D-23)

- (23) Remove the low range gear by removing the snap ring that retains the roller bearing onto the rear shaft. Press the roller bearing off of the shaft.



(Step D-24)

- (24) Now that the roller bearing is removed, you will see a spacer. Remove the spacer, **being careful not to lose the ball bearing underneath it**. Remove the low range gear and needle bearing. You will be replacing this gear with a Trail Tamer gear.



ASSEMBLY



(Step A-1)

- (1) Notice that the Trail Tamer cluster / counter gear does not incorporate the stock sub-gear and spring washer. These are not used!



(Step A-4)

- (4) Install the ball bearing and spacer. Use a drop of assembly lube to hold the small ball bearing in place during assembly.



(Step A-2)

- (2) Install the cage needle bearing on the output shaft. Use assembly lube provided in the kit!



(Step A-5)

- (5) Reinstall the original roller bearing on the output shaft. **Note snap ring groove orientation on bearing!**



(Step A-3)

- (3) Install the new Trail Tamer low range gear. Apply a small amount of assembly lube to the caged roller bearing.



(Step A-6)

- (6) Install the snap ring that retains the output shaft bearing in place.



(Step A-7)

- (7) Install the output shaft assembly into the case. You might have to tap it in gently with a soft plastic hammer.



(Step A-8)

- (8) Install a new snap ring (provided in the kit) that holds in the bearing for the output shaft.



(Step A-9)

- (9) Install the bearing retainer into its original position. Apply Loctite 242 and install the 4 bolts removed earlier. Torque evenly to 13 ft./lbs.



(Step A-10)

- (10) Press on the cluster / counter gear and input gear bearings. Be sure to install new snap rings that retain the bearings on the shafts.



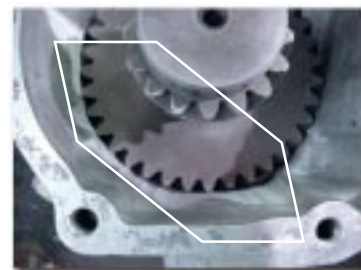
4.77 cluster interference

(Step A-11)

- (11) Install the cluster and input gears into the reduction case. A slight tap from a soft plastic hammer should be all it takes to get them seated. Note: On the 4.77 & 5.0 gears, the case must be machined to provide clearance for the cluster gear. On some 4.0 cluster gears, we have found that the case will need to be relieved due to core shift. Spin the cluster gear to check for interference.



You can grind the necessary clearance; however, it is recommended to machine the case for this clearance. We used a 1" coarse pitch roughing end mill and took approximately .050" off the inside case wall. (We also offer a new front housing that has the proper gear clearance, [P/N 51-5911](#))



(Step A-12)

- (12) If your case uses the large E-clip, remove and replace with the new C-clip (supplied in kit). [See Photo A-12a](#). The shift fork/rail assembly should be test fit before proceeding with the assembly. Some grinding on the fork rail boss may be required to clear the larger gear. [See Photo A-12b](#) for grinding locations.

As a final check, reinstall shift rails/fork assembly over new gear and temporarily install mating case so that the shift rails are indexed into the case. The gear should rotate easily with no interference. Now remove case half and go on to Step 13.



↑
New style
C-clip
supplied.

↑
Discard this
E-clip.



Photo A-12a

Photo A-12b



(Step A-13)

- (13) Install new snap rings that retain the cluster / counter and input gear assemblies in place.



(Step A-14)

- (14) Install the output shaft "pocket" needle bearing. Apply assembly lube!

(Step A-15)

- (15) Install the clutch sleeve and the high/low shift fork set into position.



(Step A-16)

- (16) Before mating the surfaces of the reduction box and the front case, apply a *few thin dabs* of RTV blue silicon sealant to the new gasket that installs between them.



(Step A-17)

- (17) Apply Loctite 242 to the 4 bolts that secure the reduction case to the front case. Torque them evenly to 29 foot/pounds using a 14mm socket.



(Step A-18)

- (18) Install the high/low range shift rail. Use assembly lube!



(Step A-19)

- (19) The shifter must be in 4WD High to install the interlock pin. Make sure it slides freely into place. Use that assembly lube!



(Step A-20)

- (20) Install the roll pin that retains the high/low shift fork in place on the shift rail.

**(Step A-21)**

(21) Notice that the Trail Tamer cluster / counter gear does not incorporate the stock sub-gear and spring washer. These are not used!

**(Step A-22)**

(22) Install the detent plugs (with Loctite 242), spring and ball assembly on both sides of the assembly cases. This will position the shift rails once the retaining plugs are installed. Torque the detent plugs to 9 ft./lbs. Use assembly lube!

**(Step A-23)**

(23) Apply a drop of assembly lube on the tip of the 4WD indicator switch and install it into its original position on the reduction case.

**(Step A-24)**

(24) Install the small ball bearing in the machined pocket on the output shaft. Use a drop of assembly lube to hold it in place.

**(Step A-25)**

(25) Install the spacer onto the output shaft.

**(Step A-26)**

(26) Install the 2 caged needle roller bearings on the output shaft. Use assembly lube.

**(Step A-27)**

(27) Install the transfer gear onto the output shaft. Use assembly lube!

**(Step A-28)**

(28) Before proceeding, make sure you have installed these snap rings!



(Step A-29)

(29) Install the shift fork and shift hub sleeve onto the output shaft.



(Step A-30)

(30) Install the roll pin that holds the front wheel drive shift fork in place.



(Step A-31)

(31) Install the clutch hub onto the output shaft.



(Step A-32)

(32) Install the bearing onto the output shaft.



(Step A-33)

(33) Install the drive gear for the speedometer onto the output shaft. Make sure the orientation is correct. The hardened side goes against the bearing.



(Step A-34)

(34) Install the ball bearing onto the pocket on the output shaft using a drop of assembly lube to hold it in place. Install the oil pump drive gear.



(Step A-35)

(35) Install the two lubrication tubes into the case. Note the orientation shown in the photo above.



(Step A-36)

(36) Apply a very thin coat of silicone gasket sealant to the rear case gasket, and position the rear case. Apply Loctite 242 to the threads and install the 10 bolts that retain the case with a 14mm socket *loosely*. You will tighten these later, after the centering of the case is performed in the following procedures.

**(Step A-37)**

- (37) Replace the outer seal in the rear tail housing. Apply a thin film of assembly lube to sealing lip of seal.

**(Step A-38)**

- (38) Apply a *few thin dabs* of silicone gasket sealant to the rear tail extension gasket and position the rear tail extension. Apply Loctite 242 to the threads and install *loosely* the 7 bolts that retain the tail extension with a 14mm socket. You will also tighten these later, after the centering of the case is performed.

**(Step A-39)**

- (39) Insert the rear drive shaft flange. This will center the cases on the seals in the rear tail extension. Use assembly lube where seal rides on driveshaft flange.

**(Step A-40)**

- (40) Now, with the seals centered on the rear shaft, torque the bolts to 34 ft./lbs.

**(Step A-41)**

- (41) Install the speedometer drive assembly and the retainer.

**(Step A-42)**

- (42) Apply a thin film of RTV sealant to the cover plate mating surface. Install the 4 bolts that hold it in place and tighten firmly. *We do not recommend using the stock gasket in this location.* On occasion we have found this gasket to slip out of position and cause a serious leak.

**(Step A-43)**

- (43) Clean and apply a bead of RTV black silicone sealant to about the middle of the spline area and slide the rear drive shaft flange into position. Install the retainer nut and torque to 90 ft./lbs. Using a chisel and hammer, fold the lip of the nut to lock it in place.

